July 1:

STS 46: MAIN ENGINE FRT

The main engines of Atlantis have completed their flight readiness test in preparation for the STS 46 mission. Other work completed: aerosurface cycle and checks; hydraulic circulation and sample operations; rudder speed brake closeouts. Work in progress: engineering evaluations of recently completed flight readiness test and hydraulic operations; preparations for payload arrival at Launch Complex 39B. The STS 46 payload is set to arrive at the pad and to be installed next week. [KSC SHUTTLE STATUS REPORT, 9:30 a.m., July 1, 1992.]

STS 47: ENDEAVOUR PROCESSING

In OPF Bay 3, payload by keel installations on Endeavour have been completed as have freon coolant loop deservicing and inspections and the removal of the payload bay door radiator. Work in progress: inspections of the payload bay door blankets; payload bay door cycling and checks; orbital maneuvering system leak and functional checks; Ku-band functional tests; spacelab/Orbiter pre-mate checks; solid rocket booster stacking operations in the Vehicle Assembly Building high bay 3. The Spacelab payload will be installed next week. [KSC SHUTTLE STATUS REPORT, 9:30 a.m., July 1, 1992.]

DISCOVERY: OMS POD DELIVERED TO OPF

Discovery's orbital maneuvering system pod has been delivered to the Orbiter in OPF Bay 2 and elevon cove and flipper door closeouts have been completed. Work in progress: mechanical and electrical mates of the orbital maneuvering system pod to the Orbiter; main propulsion system leak and functional checks; installation of onboard helium tanks; installation of hydraulic lines and equipment; structural corrosion inspections. [KSC SHUTTLE STATUS REPORT, 9:30 a.m., July 1, 1992.]

ATLANTIS TO BE MODIFIED IN CALIFORNIA

Atlantis is due for extensive modifications similar to the ones undergone by Columbia and Discovery, but, unlike Discovery, Atlantis is expected to be sent to the Palmdale, CA, plant where Columbia was modified by Rockwell International. That announcement was made by **Thomas Utsman**, Shuttle Program Director for NASA. NASA officials said the decision to modify Atlantis in California was made to relieve processing pressure at Kennedy Space Center. He said, "This means the KSC team can devote 100 percent of their efforts to safely and efficiently carrying out the manifest. We estimate it will require about a year to modify Atlantis, and we won't have to tie up an Orbiter processing facility for that time. This results in a lot of flexibility in terms of processing the other Orbiters. Performing the work at Palmdale also gives us the added advantage of being able to maintain a skilled, highly effective work force in California which is essential for us to carry out our structural spares work. By maintaining this manufacturing capability at Palmdale, NASA also will be able to integrate a Russian automated rendezvous and docking mechanism should ongoing negotiations with the Russians prove fruitful. NASA has a team leaving for Russia next week to pursue this capability, which would allow the Space Shuttle to dock with the Russian Mir and which could be used on Space Station Freedom."

NASA also said that Atlantis will have a mechanism installed which will allow the Orbiter to dock with the Russian space station Mir. U. S. Rep. **Jim Bacchus** said, "If they did the work here, it would create several hundred jobs. I think we can do these modifications faster, cheaper and better in Brevard County." He said that cost comparisons showed that KSC could do the modifications for $25 to $30 million less than in California. "I'm very unhappy about this decision and I'm going to hold NASA's feet to the fire," Bacchus said. Utsman responded, saying, "One of the things we got criticized for after the Challenger accident was pushing too hard and trying to do too many things with the guys at the Cape. This is an honest attempt to try to help them. What we want to do is make their job bearable." Utsman, a former Kennedy Space Center Deputy Director, said that the decision would not result in any jobs being lost at KSC. [Halvorson, FLORIDA TODAY, p. 1A, July 2, 1992; NASA/KSC News Release No. 92-101, July 1, 1992; Date, THE ORLANDO SENTINEL, July 3, 1992; Halvorson, FLORIDA TODAY, p. 10E, July 26, 1992.]

July 2:

ATLAS LAUNCH ATTEMPT NO. 7

The Air Force will attempt, again, to launch its Atlas 2 rocket tonight between 5:54 and 7:20 p.m. EDT; the launch has been scrubbed six times over the past two weeks. Air Force meteorologists predicted a 70 percent chance of favorable weather for launch tonight. ["Atlas Launch Attempt Today," FLORIDA TODAY, p. 5A, July 2, 1992.]

RECORD SPACELAB TURNAROUND

When the Spacelab-J module is transported to the Orbiter Processing Facility and installed in Endeavour's payload bay next week, it will mark the quickest such turnaround ever of a Spacelab module. The Spacelab-J module last flew in January on the International Microgravity Laboratory-1 mission. Following that highly successful flight, the module was transported back to its processing bay in KSC's Operations and Checkout Building and readied for the STS 47 flight. The 19-week reconfiguration and checkout of the payload easily eclipses the average Spacelab processing time of 24 weeks. "We surprised ourselves," commented **Glenn Snyder**, STS 47 Payload Processing Manager. "We went into this flow wondering whether or not it was possible to process a payload for flight on such a tight schedule. But the team pitched in, rose to the challenge and did it. Everyone pulled together as a team. There were never any turf battles or squabbles over anything. When little problems popped up, everyone just came together and fixed them," he continued. "It's been a real pleasure working on this payload."

TITAN III ROLLOUT TODAY

The Titan III launch vehicle which will deliver the Mars Observer Spacecraft to an interplanetary trajectory was rolled out to Launch Complex 40 today. The Martin Marietta rocket will propel the MOS on an 11-month journey to Mars. The mission must launch between September 16 and October 13 while Earth and Mars are properly aligned or wait for two years for another such alignment. A delay of that duration would cost NASA $200 million. Currently, the launch is scheduled for September 16 during a window lasting from 1:02 to 2:34 p.m. NASA spokesman **George Diller** said, "So far the best laid plans of mice and men are working. The mission is coming together as envisioned." [Halvorson, FLORIDA TODAY, p. 10E, July 5, 1992; NASA/KSC News Release No. 85-92, July 1, 1992.]

ATLAS 2 LAUNCHED TODAY

At 5:54 p.m. today, the Air Force launched its Atlas 2 rocket from Cape Canaveral Air Force Station. "We're really happy to have seen it go," said Major Garian Perugini, head of Public Affairs at Patrick Air Force Base. "It's been a long, drawn-out process with the weather systems that have been moving through and some of the mechanical problems we've had along the way." The Atlas payload was a $160 million Defense Satellite Communications System spacecraft; it is an updated version of the satellites which provided intelligence information during the 1991 Persian Gulf War. [Halvorson, FLORIDA TODAY, p. 5A, July 3, 1992.]

July 6:

COLUMBIA TO LAND AT EDWARDS

The landing of the Space Shuttle Columbia is scheduled to occur at Edwards Air Force Base, CA, at 6:08 a.m. PDT on July 8. Kennedy Space Center's landing and recovery team will be on hand at the Dryden Flight Research Facility to prepare to prepare the Orbiter for its ferry flight back to KSC. STS 50 has set a new duration record for flights of Space Shuttles of 12 days, 20 hours and 56 minutes. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 6, 1992; Date, THE ORLANDO SENTINEL, July 6, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., July 7, 1992; Halvorson, FLORIDA TODAY, p. 1A, July 7, 1992; "Shuttle Record," USA TODAY, p. 3A, July 7, 1992; Date,"Columbia Sets Endurance Record," THE ORLANDO SENTINEL, July 7, 1992.]

ATLANTIS: TSS & EURECA

Early this morning the TSS and EURECA payloads were transferred to Launch Complex 39B for installation in the Space Shuttle Atlantis. The STS 46 mission is targeted for launch in late July. Work in progress: preparations to install the Tethered Satellite System and the EURECA payload in the Payload Changeout Room at the pad; retest of the newly replaced main engine liquid oxygen temperature transducers. Work scheduled: Launch Readiness Review on July 7; installation of payloads on July 8; the interface verification testing between the Orbiter and payloads July 9. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 6, 1992.]

ENDEAVOUR: STS 47 PREPARATIONS

In OPF Bay 3, technicians are preparing to install the Spacelab-J payload in Endeavour for its upcoming STS 47 mission. Other work in progress: functional tests of the orbital maneuvering system pod; leak and functional tests of the auxiliary power units; inspections of the payload bay doors. The Spacelab-J will be installed in Endeavour on July 8. Discovery is in OPF Bay 2 where preparations are underway to install its right OMS pod next week. Other work in progress on OV 103: tests of the Ku-band antenna; inspections of the main propulsion system; flushing the ammonia system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 6, 1992.]

July 7:

ATLANTIS PRE-LAUNCH ACTIVITIES

Technicians at Launch Complex 39B continue preparations to install the TSS and EURECA payloads into Atlantis for its STS 46 mission. Work in progress: moving the rotating service structure around the Orbiter; connecting the Orbiter midbody umbilical unit (OMBU) to the Orbiter; opening the payload bay doors for payload installation; KSC Launch Readiness Review. Work scheduled: installation of payloads on July 8; interface

verification testing between the Orbiter and its payloads July 9. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 7, 1992.]

STS 47: ENDEAVOUR IN OPF BAY 3

The Space Shuttle Endeavour is undergoing processing for its upcoming STS 47 flight in OPF Bay 3. Work in progress: preparations to install the Spacelab-J payload; functional tests of the orbital maneuvering system pod; leak and functional tests of the auxiliary power units; inspections of the payload bay doors. The installation of Spacelab J and Endeavour's forward reaction control system are scheduled to take place shortly. In OPF Bay 2, Discovery is having its ammonia system flushed and is undergoing testing of the right orbital maneuvering system pod; preparations to service the hydraulic system and inspections of the main propulsion system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 7, 1992.]

JULY 30 LAUNCH FOR STS 46

Kennedy Space Center spokeswoman **Lisa Malone** announced today that Atlantis will commence its STS 46 mission on July 30; the launch has been delayed a week to make way for a "time-critical" unmanned rocket mission and to allow more time for astronaut training. The previous target date had been July 23. [Halvorson, FLORIDA TODAY, p. 1A, July 8, 1992; Date, THE ORLANDO SENTINEL, July 7, 1992.]

DELTA 2 LAUNCH A SUCCESS

At 5:20 a.m. this morning, an Air Force Delta 2 was launched from Cape Canaveral Air Force Station. The Delta carried a Navstar Global Positioning System satellite. The rocket's nine boosters were jettisoned several minutes into the flight. McDonnell Douglas Space Systems Co. spokesman **Tom Williams** said, "The night launches are beautiful - beautiful and exciting." This Navstar deployment was the 14th in a planned series of 24 satellites; the entire system is expected to be completed in 1993. [Halvorson, FLORIDA TODAY, p. 2A, July 8, 1992; Date, THE ORLANDO SENTINEL, July 8, 1992.]

LAUNCH FACILITY DEDICATED AT CCAFS

Shortly after the successful launch of a Delta 2 rocket from Cape Canaveral Air Force Station this morning, the Air Force and NASA joined with other aerospace officials to dedicate a $335 million launch facility that will be used to launch unmanned missions to Mars. Standing in front of Launch Complex 40, and speaking to an audience of 200, officials praised the effort of constructing a completely new facility in two years. Martin Marietta Space Launch Systems was the prime contractor for the new complex; Bechtel National, Inc. constructed the facility. **Alphonso Diaz**, NASA Deputy Associate Administrator for Space Flight, said return to the "red" planet with the launch of the Mars Observer aboard a Martin Marietta Commercial Titan begins at the facility. Diaz spoke proudly of the time 17 years ago when he was an instrumentation engineer on the Voyager mission to Mars in 1975.

"The Mars Observer mission will provide data crucial to eventual human expedition to Mars," Diaz said. "It begins here within the next 90 days," referring to Launch Complex 40. Diaz complimented workers responsible for the construction and said, "you delivered on your commitment - now it is time for NASA to perform." Colonel **Frank Stirling**, Titan IV Manager for the USAF, described LC 40 as a magnificent achievement that will return

the nation to Mars. "Today is a triumph," he said, "a triumph of team work, a display of dedication of commitment to excellence and presentation to perseverance to a goal of meeting this nation's requirements to send a satellite on an interplanetary mission to Mars." Two years ago the USAF promised NASA a new launch complex would be ready for the September launch, Stirling told the audience and said that we are on the threshold of that promise. ["Aerospace Community Dedicates $355 Million Launch Facility," MARTIN MARIETTA PRESS RELEASE, July 7, 1992; Note to Editors/News Directors: "Mars Observer Showing Scheduled at KSC on Wednesday, July 8," July 9, 1992.]

ASSOCIATE ADMINISTRATOR FOR RUSSIAN PROGRAMS

NASA Administrator **Daniel S. Goldin** today announced the appointment of **Samuel W. Keller** as Associate Administrator for Russian Programs. The new function is being established within the Office of the Administrator and will give focus to the many programs involving NASA and the former Soviet Union. "NASA is actively pursuing opportunities for expanded cooperation in space activities with Russia. This area of international cooperation is critical and warrants creation of this new position. Sam Keller has the kind of experience necessary to ensure that our relationship with the Russian space program is beneficial to both sides. He will be responsible for overall coordination of the NASA program relating to cooperative endeavors with the Russian space program," Goldin said. [NASA/KSC News Release No. 92-103, July 7, 1992; "NASA Appoints Chief of Russian Programs," FLORIDA TODAY, p. 9E, July 12, 1992.]

July 8:

STS 50 EXTENDED ONE DAY

Columbia's record-breaking-duration flight was extended one extra day because of unacceptable weather conditions in California. There were rain showers and clouds in the area of Edwards Air Force Base. Weather conditions are forecast to improve slightly tomorrow in California and to be favorable for a landing in Florida. Mission controllers will continue evaluating the weather conditions at both landing sites through the evening and make their landing decision early tomorrow morning. The opportunity to land at KSC tomorrow is at 7:43 a.m. EDT. The landing opportunity at Edwards is on orbit 222 at 9:09 EDT. The KSC convoy team will be on station at 5:15 a.m. tomorrow at the Shuttle Landing Facility to support a possible landing at Kennedy Space Center. KSC's primary landing and recovery team for Columbia is on station at the Dryden Flight Research Facility ready to prepare the Orbiter for its ferry flight back to Florida. [Date, THE ORLANDO SENTINEL, p. A-7, July 8, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., July 8, 1992; Date, THE ORLANDO SENTINEL, p. A-7, July 9, 1992.]

STS 46: RSS SURROUNDS ATLANTIS

At Launch Complex 39B, workers have completely surrounded Atlantis with the rotating service structure and connected the Orbiter midbody umbilical unit (OMBUU) to the Orbiter. The payload bay doors have been opened for payload installation; the KSC Launch Readiness Review has been completed. No significant problem issues were addressed at the LRR and all KSC elements are pressing forward to the next Shuttle launch. The installation of the Tethered Satellite System and the EURECA payload is underway at the pad. Interface verification testing will begin tomorrow at LC39B; the Flight Readiness Review is scheduled at KSC for July 10. The target date for the flight is July 30. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 8, 1992.]

STS 47/SPACELAB-J: ENDEAVOUR

While in Orbiter Processing Facility 3, Endeavour continues to undergo preparations to install the Spacelab-J payload. Other work in progress: transfer of Endeavour's forward reaction control system from the Hypergolic Maintenance Facility to the OPF; functional tests of the orbital maneuvering system pod; leak and functional tests of the auxiliary power units and inspections of the payload bay doors. This weekend Spacelab-J will be installed; the FRCS is scheduled for installation July 9. Discovery remains in OPF Bay 2 where it is being processed for its STS 53 mission; work in progress: testing of the right orbital maneuvering system pod; preparations to service the hydraulic system; inspections of the main propulsion system and flushing of the ammonia system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 8, 1992.]

July 9:

STS 50 STATUS/4:10 A.M. EDT

Weather conditions for a landing at Edwards AFB this morning are marginal with a forecast of "no go." Concerns include the possibility of rain within 30 nautical miles and mid-level cloud decks. At KSC the only weather concern was the possibility of ground fog and reports from a weather aircraft indicate that visibility will not be a problem. Winds should be at a low level out of the southwest. Based on current conditions, a landing would be made on Runway 33. This call would be made on lightning considerations as wind conditions are not now a factor. A landing convoy with Orbiter servicing equipment and about 150 personnel is in place at the KSC Shuttle Landing Facility to support a landing here. The deorbit burn for a 7:43 a.m. EDT landing at KSC would be made at 6:47 a.m. A decision on the landing site is not expected until between 5:45 and 6 a.m. This morning's landing opportunity at Edwards AFB is one orbit later than that at KSC. The deorbit burn would be made at 8:11 a.m. EDT for a landing at 9:09 a.m. This would be at 6:09 a.m., local time, approximately 23 minutes after sunrise. Astronaut **Kenneth S. Reightler Jr.** radioed the crew: "It looks like Mother Nature is giving you a chance to get a tighter grip on your record;" Columbia's STS 50 mission is the longest Shuttle flight to date. If both landing sites should be unavailable, Columbia has enough supplies to stay in orbit safely for two more days. The astronauts serenaded Mission Control with a chorus from the 1960 hit "Stay." They sang: "Oh pleeeease, stay a little bit longer." Mission Control had played the song for them the day before when the crew was informed that an extra day had been added to their flight. ["Status of STS-50/Columbia," July 9, 1992; Brown, FLORIDA TODAY, p. 1A, July 9, 1992.]

COLUMBIA LANDS AT KSC

"Congratulations on the longest Shuttle flight on record. Thanks for helping to pave the way to Space Station operations," said astronaut **Kenneth S. Reightler Jr.** to the STS 50 crew from Mission Control (Houston, TX). Columbia's record-breaking-duration flight ended today with a landing at 7:43 a.m. EDT on KSC's Shuttle Landing Facility Runway 33. Today's landing marked the first time Columbia returned from space to Kennedy Space Center and was the 10th Shuttle landing at the launch site. Weather conditions in California wee unacceptable for landing today. The Orbiter touched down at about 2,800 ft. mark on the runway and stopped at the 13,000 ft. mark. Total mission elapsed time was 13 days, 19 hours, 30 minutes, and 4 seconds. Columbia's deorbit burn occurred on orbit 220 at 6:41 a.m. EDT and lasted about 3 minutes, 24 seconds. Columbia completed 221 revolutions around the Earth and logged 5,758,000 miles during this flight.

At the conclusion of the flight, Commander **Richard N. Richards** spoke for the crew: "We're looking forward to seeing our families - who unfortunately were not able to change landing sites as quickly as we were and will be waiting for us when we get back to Houston tonight. It's been a long day, particularly for our crewmates who had put in a full shift closing out Spacelab before we left orbit, so we need to get everyone home for some rest as soon as possible." KSC Director **Robert L. Crippen** said that the crew was in good spirits and showed no ill effects from their extended flight. "It was a completion of a great mission. The vehicle has come back looking outstanding; the crew is all looking good and very excited," he said. Crippen also noted that after the rear wheels of Columbia touched down at KSC, the nose wheel stayed up a few seconds longer than usual - 18 seconds - to make sure the nose came down gently; the concern was due to the 23,000-pound laboratory in the payload bay.

The STS 50 flight crew was scheduled to depart at 2:30 p.m. today from the skid strip at Cape Canaveral Air Force Station. They will be flying to Ellington Field, TX, near the Johnson Space Center (Houston, TX). KSC's landing and recovery team is preparing Columbia for tow to Orbiter Processing Facility Bay 1 later today. One of the tires on the main landing gear will be removed while the vehicle is on the runway for immediate shipment to the vendor for analysis. This is the first flight of the new beefed-up tires which use a synthetic rubber tread instead of the natural rubber previously used. Kennedy Space Center Director **Crippen** said that a safety rule limiting planned Florida landings to Orbiters weighing 205,000 pounds or less would be discarded if the new tires work as designed. "The heavy weight didn't bother me at all. We do not have to get through the full evaluation on the tires," he said, adding that a quick inspection showed little damage to Columbia's landing gear. [KSC SHUTTLE STATUS REPORT, 11 a.m., July 9, 1992; "Post Flight Statement by STS 50 Commander Dick Richards," July 9, 1992; Halvorson, FLORIDA TODAY, p. 1A, July 10, 1992; "New Attitude," FLORIDA TODAY, p. 1A, July 10, 1992; "In Florida," USA TODAY, p. 4A, July 10, 1992; "Longest Shuttle Flight Ends With Florida Landing," THE NEW YORK TIMES, p. A7, July 10, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-10, July 10, 1992.]

STS 46: TSS/EURECA INSTALLED

At Launch Complex 39B, the Tethered Satellite System and EURECA payloads have been installed in the cargo bay of Atlantis; the Orbiter's STS 46 mission is now targeted for no earlier than August 1. Interface verification tests between the EURECA payload and the Orbiter are underway. The Flight Readiness Review for STS 46 begins July 11. [KSC SHUTTLE STATUS REPORT, 11 a.m., July 9, 1992; Halvorson, FLORIDA TODAY, p. 4A, July 10, 1992.]

ENDEAVOUR/DISCOVERY PROCESSING

In OPF Bay 3, Endeavour is being mated with its forward reaction control system and preparations are underway to install the Spacelab-J payload this weekend. Leak and functional tests of the auxiliary power units have begun as have inspections of the payload bay doors with the doors in a closed position. Discovery, located in OPF Bay 2, is having its right orbital maneuvering system pod tested. Preparations are underway to service the Orbiter's hydraulic system and to inspect the main propulsion system. [KSC SHUTTLE STATUS REPORT, 11 a.m., July 9, 1992.]

MARS OBSERVER MILESTONE

The Mars Observer spacecraft passed another major milestone toward launch in September when it was transported from Hangar AO on Cape Canaveral Air Force Station to the Payload Hazardous Servicing Facility (PHSF) on the Kennedy Space Center. Mars Observer has been at Hangar AO undergoing testing of its instruments, communications and spacecraft systems since it arrived at the Cape on June 19. At the PHSF, the next major activity will be to fuel the spacecraft with its orbit insertion and attitude control propellants. This will be followed by mating to the Transfer Orbit Stage (TOS) which is currently scheduled to occur on August 2. This is the upper stage that will provide the final thrust to propel the spacecraft on its 11-month journey to Mars.

After the TOS has also been fueled with its control propellant, there will be integrated testing of the two flight elements, followed by encapsulation in the nose fairing. The Mars Observer/TOS combination is scheduled to be moved to Launch Complex 40 for mating with the Titan III Launch Vehicle on August 17. Mars Observer will be the first U. S. mission launched to Mars since the Viking program in 1975. From a circular Martian polar orbit of 250 miles it will conduct a comprehensive study for one Martian year, or 687 Earth days, mapping the surface and profiling the atmosphere. The liftoff of Mars Observer is scheduled for September 16 at the opening of a launch window which extends from 1:02 p.m. EDT until 2:34 p.m. EDT. [NASA/KSC News Release No. 89-92, July 9, 1992.]

July 10:

INTERFACE TESTS FINISHED

At Launch Complex 39B, technicians have completed interface verification tests between Atlantis and its EURECA payload and its remote manipulator system. The Flight Readiness Review for the STS 46 mission is underway. Interface verification tests between Atlantis and its Tethered Satellite System payload will be completed this weekend. Ordnance operations begin July 13 with the launch set for no earlier than August 1. [KSC SHUTTLE STATUS REPORT, 11 a. m., July 10, 1992.]

COLUMBIA TOWED TO OPF

Columbia, just returned from its 14-day STS 50 mission, has been towed from the Shuttle Landing Facility to the OPF; that occurred at 1 p.m. yesterday. OPF workers are now offloading experiments from the middeck; gaining access to various parts of the Orbiter and connecting purge equipment to the vehicle. Shortly technicians will begin offloading residual cryogenic propellants from Columbia. [KSC SHUTTLE STATUS REPORT, 11 a. m., July 10, 1992.]

ENDEAVOUR/DISCOVERY PREPARATIONS

In OPF Bay 3, technicians are preparing to install Endeavour's Spacelab-J payload on July 13; cycling the payload bay doors and conducting leak and functional tests of the main propulsion system. Endeavour has been mated with its forward reaction control system in preparation for its upcoming STS 47 mission. In OPF Bay 2, Discovery is being readied for its STS 53 mission. Technicians are conducting leak checks of the auxiliary power units; testing the right orbital maneuvering system pod and preparing to service the Orbiter's hydraulic system. [KSC SHUTTLE STATUS REPORT, 11 a. m., July 10, 1992.]

STS 46: JULY 31 LAUNCH; IT'S OFFICIAL

NASA managers today announced July 31, 1992, as the official launch date for Shuttle Mission STS 46. Atlantis will carry two international payloads - the Tethered Satellite System (TSS-1), a project jointly developed by NASA and the italian Space Agency and the European Carrier (EURECA) payload which was developed by the European Space Agency. The launch window on the 31st opens at 9:56 a.m. EDT and extends for 2 1/2 hours. Atlantis will be commanded by USAF Col. **Loren J. Shriver**, making his third Shuttle flight. Marine Corps Major **Andrew M. Allen** will serve as pilot, making his first flight. Mission Specialists will include **Claude Nicollier**, a European Space Agency astronaut making his first Shuttle flight; **Marsha S. Ivins**, making her second Shuttle flight; **Jeffrey A. Hoffman**, making his third space flight; and **Franklin R. Chang-Diaz**, making his third space flight. **Franco Malerba** from the Italian Space Agency will be a payload specialist aboard Atlantis. STS 46 will be the 12th flight of Space Shuttle Atlantis and the 49th flight of the Shuttle system overall. [Note to Editors: NASA Sets Launch Date for Next Shuttle Mission, 6:00 p.m., July 10, 1992.]

July 12:

ATLANTIS: ROUTINE PROCESSING

At Launch Complex 39B this weekend, workers have been testing connections between Atlantis and its Tethered Satellite System payload. Ordnance operations, in two phases, have begun at the pad with the hazardous part being scheduled for late tonight. There will be few other pre-launch activities scheduled due to the delay in launching Atlantis because of conflicts with other unmanned missions. Flight control teams and the STS 46 crew are undergoing additional training during this period. [Banke, FLORIDA TODAY, p. 2A, July 12, 1992.]

HYDROSTATIC BEARINGS/NEW DESIGN

Rocketdyne has come up with a new type of bearing that would solve a serious shortcoming with the bearings now in use in the turbopumps now on the Space Shuttles. The invention comes too late for inclusion on Atlantis. Rocketdyne President **Robert Paster** said, "We've been looking at a totally new concept in bearings." The new concept eliminates the need for "ball bearings" and replaces them with a thin film of liquid oxygen in a uniquely-shaped chamber; they would operate similarly to the way "air bearings" do in a dentist's drill. Hundreds of tests will be required before a Shuttle will fly with the new bearings, but NASA has been impressed and NASA will consider the hydrostatic bearings for the new Space Transportation Main Engine which has been proposed to lift the National Launch System rockets after the year 2000. [Banke, FLORIDA TODAY, p. 10E, July 12, 1992.]

July 13:

SR 3: WORK BEGINS JAN. 1993

Brevard County will resume work on widening State Road 3 north of the Barge Canal in January 1993. The widening project was initially delayed because the county failed to purchase all the needed right of way. Much of the land was acquired in March 1992 in a court hearing, but some of the prices to be paid have yet to be negotiated and the county must also now acquire more land for drainage retention. Working with KSC, Sea Ray Boats Inc., the Coast Guard, the Brevard County School Board, the Florida Department of Transportation, Commissioner **Karen Andreas** and the County Commission, a number of changes and improvements have been decided upon. The SR 3 Barge Canal will now open earlier starting today at 5:00 a.m., rather than at 6:00 a.m. Other

changes include: synchronizing traffic lights near SR 3, SR 528 (the Bee Line) and Sea Ray Boats Inc.; reducing the number of school bus routes north of the bridge and altering schedules of some Sea Ray workers. [Reitz, FLORIDA TODAY, p. 1A, July 13, 1992.]

[] **SPACELAB INSTALLED IN ENDEAVOUR TODAY**

At Kennedy Space Center today, technicians in Orbiter Processing Facility Bay 3 will begin to install a Spacelab module in Endeavour. This module is called Spacelab J and will contain more than 50 material and life science experiments. Endeavour's STS 47 mission is targeted for mid-September and will be jointly sponsored by Japan and the United States. [Brown, FLORIDA TODAY, p. 3A, July 13, 1992.]

[] **STS 46: ORDNANCE OPERATIONS**

Ordnance operations for STS 46 were completed earlier today at Launch Complex 39B where Atlantis awaits a July 31 launch. The Flight Readiness Review which was completed July 10 set the target date for launch. Interface verification tests between the Orbiter and its payloads - TSS-1 and EURECA - have been completed. Work in progress: close outs of the Orbiter's aft compartment and checks of the mobile launcher platform liquid oxygen system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 13, 1992; "KSC Wraps Up 1st Part of Task to Install Ordnance on Atlantis," FLORIDA TODAY, p. 2A, July 14, 1992.]

[] **STS 50: POST-LANDING WORK**

Technicians in OPF Bay 1 have offloaded residual cryogenic propellants from Columbia which landed at Kennedy Space Center on July 9. Experiments have been removed from Columbia's middeck and the Orbiter's main engine bearings have been dried. Work in progress: installing platforms in the aft compartment; attaching strongbacks to the payload bay doors and removal of the waste containment system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 13, 1992.]

[] **ENDEAVOUR/DISCOVERY: OPF WORK**

Functional tests of Endeavour's right orbital maneuvering system pod have been completed in OPF Bay 3. Work in progress: functional tests of the forward reaction control system; connections of the radiators; preparations to install the Spacelab J payload; leak and functional tests of the main propulsion system. The Spacelab J payload will be installed July 14. Discovery is undergoing tests of its Ku-band antenna during processing in OPF Bay 2; other work includes leak checks of the galley water lines and preparations to service the hydraulic system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 13, 1992; KSC Wraps Up 1st Part of Task to Install Ordnance On Atlantis," FLORIDA TODAY, p. 2A, July 14, 1992.]

July 14: **SPC EXTENSION FOR LOCKHEED**

NASA's John F. Kennedy Space Center (KSC), FL, has extended for 3 years its Space Shuttle Processing Contract (SPC) with Lockheed Space Operations Co. (Titusville, FL). The 3-year extension, through Sept. 30, 1995, is valued at $1,830,915,860. The original contract was awarded Sept. 23, 1983, and provided for a 3-year period of performance and four 3-year options. "All of us at Lockheed are very, very pleased with the extension," said company spokesman J. B. Klump. Kennedy Space Center spokesman Karl

Kristofferson said, "The three-year extension is an indication that NASA is pleased with Lockheed's performance as Shuttle Processing Contractor." The current extension exercises the third of these options. The present contract value for the 9-year period since the contract was competitively awarded in 1983 is $6,298,810,414. The contract extension will be performed under a cost-plus-award-fee agreement. Lockheed's responsibilities include complete processing services including preparation of the Space Shuttle vehicle for each unique mission and checkout, launch, landing and recovery operations. Lockheed also is responsible for operation and maintenance of related processing facilities and ground services at KSC. [NASA/KSC News Release No. C92-8, July 14, 1992; Halvorson, FLORIDA TODAY, pp. 1A-2A, July 16, 1992.]

ATLANTIS: PRE-LAUNCH PROGRESS

At Launch Complex 39B, technicians are closing out the aft compartment of Atlantis in preparation for its July 31 STS 46 mission and are closing out the solid rocket booster hold down posts. Work scheduled: installation of two contingency space suits in the airlock next week; purges of the external tank; installation of doors on the aft compartment for flight; start of the countdown at 4:00 p.m. EDT on July 28; launch on the 31st is set for 9:56 a.m. EDT. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 15, 1992.]

SPACELAB J LOADED INTO ENDEAVOUR

"This is certainly one of the major milestones in the processing facility," said KSC spokeswoman **Lisa Malone** about the installation of Spacelab J in Endeavour's cargo bay for its mid-September STS 47 mission; the job was finished at 5:36 p.m. EDT. The mission will include Mission Specialist **Mamoru Mohri**, the first Japanese astronaut to fly on the Shuttle. Work in progress: electrical connections of Spacelab J; servicing Spacelab J cooling lines; installation of Tacan No. 3 antenna; functional tests of the forward reaction control system; leak and functional tests of the main propulsion system. Endeavour will be moved to the Vehicle Assembly Building in mid-August for mating with its external tank and solid rocket boosters. At Launch Complex 39B, technicians continued to ready Atlantis for its STS 46 mission, now scheduled to launch on July 31. Aft compartment tests are expected to be completed next week. [Halvorson, FLORIDA TODAY, p. 2A, July 15, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., July 15, 1992.]

POST STS 50 PROCESSING FOR COLUMBIA

The Space Shuttle Columbia has had its payload doors opened and functional tests have been performed. Now in OPF Bay 1, technicians are underway with preparations of Columbia to deservice residual hypergolic propellants and inspections of the radiators. Later this week, workers will remove the United States Microgravity Laboratory-1 from Columbia's cargo bay. Discovery, in OPF Bay 2, is being prepared for the installation of its left orbital maneuvering system (OMS) pod; leak and functional tests of the main propulsion system; filling and bleeding of the hydraulic system and testing of the right OMS pod. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 15, 1992.]

CAL-STAR, INC. WINS KSC CONTRACT

Cal-Star Co., Inc. (Titusville, FL) has been awarded a $161,890 contract to construct an addition to a heavy equipment maintenance building at Kennedy Space Center. Work for the construction of a heavy equipment high bay addition to Building K6-1995 is expected to begin during the week of July 27, 1992. Under the terms of the fixed price contract,

the small business firm will have 150 days from the start date to complete the project. The facility is located on the east side of Contractors Road in the Heavy Equipment Shop Maintenance section of the Launch Complex 39 area. The 2,750-square-foot high bay will be used to service heavy equipment in support of Space Shuttle Launch Complexes 39A and 39B. The van used to transport Shuttle mission crews from the Operations and Checkout Building to the launch pad prior to liftoff is also serviced in the area. [NASA/KSC News Release No. 91-92, July 14, 1992.]

MIMS FIRM GETS KSC CONTRACT

Oneida Construction Co. (Mims, FL) has been awarded a $138,417 contract to construct storage at Kennedy Space Center for a Solid Rocket Motor (SRM) Transporter. Work on this fixed price contract is scheduled to begin June 15, 1992. The small business firm will have 110 days after startup to complete the requirements of the contract. The work includes the erection of a 3,044-square-foot prefabricated shelter for the truck-like transporter on the north side of the Crawler-Transporter Building near the Vehicle Assembly Building (VAB). The SRM Transporter is used to move fueled Space Shuttle solid rocket motor segments that arrive at the Rotation, Processing and Surge Facility (RPSF) by rail to High Bays 1 and 3 in the VAB. The four segments of each of two boosters, along with their aft skirts, frustums and nose cones, are assembled atop a Mobile Launcher Platform. Then the Shuttle's external tank is mated to the completed boosters. When the Shuttle Orbiter is mated to the external tank, the fully assembled space vehicle is ready to be transported to Launch Complex 39A or 39B atop the Crawler-Transporter. [NASA/KSC News Release No. 92-92, July 14, 1992; "Mims Company Wins Contract," FLORIDA TODAY, p. 10E, July 19, 1992.]

HOLLY HILL FIRM WINS SPACE STATION CONTRACT

Dan Rice Construction Co., Inc. (Holly Hill, FL) has been awarded a $6,958,220 contract to build the Hazardous Processing Facility (HPF) at Kennedy Space Center which will be used to process the propulsion assemblies that provide the thrust to allow Space Station Freedom to maintain its orbit and attitude. The new facility will replace the existing Payload Spin Test Facility. Work covered by the firm fixed price contract is to begin October 1, 1992, and be completed within 14 months. It includes the labor, equipment and materials to construct the HPF next to the Payload Hazardous Servicing Facility (PHSF) in the KSC Industrial Area. Under this agreement, the contractor will also expand the Hazardous Operations Support Facility (HOSF), a prefabricated building near the HPF, PHSF and other KSC facilities where Space Shuttle payloads that require hazardous operations can be processed.

The HPF will feature a 1,800-square-foot high bay with an environmentally-controlled atmosphere to prevent contamination of the Space Station flight hardware during inspection, checkout and other processing activities prior to integrating the propulsion assemblies into the Space Shuttle Orbiter's payload bay. An adjoining 9,000-square-foot low bay area will provide storage space for one propulsion assembly, servicing equipment and offices. Hazardous operations that will take place in the HPF include the loading of hydrazine propellant and other types of toxic or otherwise harmful gases and fluids into propulsion assembly tanks. Ventilation systems and safety devices in the HPF will protect KSC processing personnel from harm. Should the need arise, the HPF could also be used to process other types of space hardware that require this type of service. Kennedy Space Center will be responsible for the prelaunch processing of all Space

Station Freedom flight hardware and its launch into orbit. [NASA/KSC News Release No. 90-92, July 14, 1992; Halvorson, FLORIDA TODAY, p. 9E, July 19, 1992.]

LSO WINS GOLDIN'S WORLD CLASS AWARD

Administrator **Daniel S. Goldin** recently presented NASA's first awards for "World Class" performance. Kennedy Space Center's Shuttle Processing Contractor Lockheed Space Operations Co. (Titusville, FL) was one of two award winners; the other was Rockwell International's Space Systems Division (Downey, CA). **Gerald Oppliger**, Lockheed president, accepted the award which was given for outstanding work in processing Orbiters for flight. ["Two Contractors Win 'World Class' Awards," FLORIDA TODAY, p. 9E, July 19, 1992; "Shuttle Team Gets Highest Award," FLORIDA TODAY, July 12, 1992.]

July 16:

STS 46: PAD PROCESSING OF ATLANTIS

A number of pre-launch activities are underway at Launch Complex 39B in preparation for the STS 46 mission of Atlantis: close outs of the aft compartment; final inspections of the base heat shield thermal protection system; testing of the environmental monitoring package on the EOIM experiment. Officials said yesterday that a minor problem with an experiment package in the cargo bay will not stall launch plans. KSC spokeswoman Lisa **Malone**, referring to an erratic sensor in the experiment, said, "We can't get an indication that it's on or off. We are going to try to see what's causing the problem and then fix it." The problem is described as minor. Work scheduled: installation of two contingency space suits in the airlock next week; purges of the external tank; installation of doors on the aft compartment for flight, next week; beginning of launch countdown at 4 p.m. EDT July 28; launch of STS 46 at 9:56 a.m. EDT on July 31, 1992. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 16, 1992l; Halvorson, FLORIDA TODAY, p. 2A, July 16, 1992.]

STS 47: ENDEAVOUR IN OPF BAY 3

Functional tests of Endeavour's forward reaction control system have been completed; the Orbiter is undergoing processing activities in OPF Bay 3. Work in progress: servicing Spacelab J cooling lines; preparations to service freon coolant loop No. 1; testing of the Ku-band antenna; leak and functional tests of the main propulsion system. Work scheduled: interface verification test between Spacelab J and Endeavour; installation of the three main engines next week. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 16, 1992l.]

COLUMBIA/DISCOVERY OPF PROCESSING ACTIVITIES

The Space Shuttle Columbia (OV 102) is being readied for its STS 52 mission in OPF Bay 1. Work in progress: preparations to remove the USML tunnel; preparations to deservice residual hypergolic propellants; inspections of the radiators; post-flight inspections of the windows and main engines. Removal of the United States Microgravity Laboratory-1 is scheduled for this weekend. Discovery (OV 103) is in Orbiter Processing Facility Bay 2 undergoing leak checks of the auxiliary power unit system; preparations to install the left orbital maneuvering system (OMS) pod; leak and functional tests of the main propulsion system; filling and bleeding of the hydraulic system; testing of the right OMS pod. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 16, 1992.]

[] **STS 46: PROBLEMS SOLVED**

An electronics assembly in an experiments package was found to be the cause of a payload problem in Atlantis; the problem unit was removed for repairs, officials said, and Atlantis remains on schedule for launch July 31. The repairs to the electronics assembly will be carried out in the Operations & Checkout (O&C) Building in the KSC Industrial Area. When repairs are complete, the unit will be reinstalled in the experiment package next week and tested. Technicians also removed a faulty computer monitor aboard Atlantis; the unit will be replaced by launch pad technicians, according to KSC spokeswoman **Lisa Malone**. Crew members recently discovered that the monitor's brightness may not be up to standards. Both problems were considered minor and no impediment to an on-schedule launch. of STS 46. [Halvorson, FLORIDA TODAY, p. 6A, July 17, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., July 17, 1992.]

July 17: **STS 46: PRE-LAUNCH WORK CONTINUES**

At Launch Complex 39B, pre-launch work continues on Atlantis: closeouts of the aft compartment; cleaning of the aft compartment; inspections of the thermal protection system base heat shield; installation of the hold down post blast shield. Work scheduled: installation of two contingency space suits in the airlock; purges of the external tank; installation of doors on the aft compartment for flight next week. No work is scheduled this weekend at the pad, according to KSC spokeswoman **Lisa Malone**. "Just about everyone has the weekend off," she said. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 17, 1992; Banke, FLORIDA TODAY, p. 2A, July 18, 1992; Banke, FLORIDA TODAY, p. 1A, July 19, 1992.]

[] **ENDEAVOUR: DRAG CHUTE INSTALLED**

In preparation for its second mission - STS 47 - technicians in OPF Bay 3 have installed the Orbiter's drag chute. Work in progress: servicing Spacelab-J cooling lines; preparations to service freon coolant loop No. 1; testing of the Ku-band antenna; leak and functional tests of the main propulsion system. Work scheduled: interface verification test between Spacelab-J and the Orbiter will occur this weekend; installation of the three main engines next week. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 17, 1992.]

[] **COLUMBIA: PAYLOAD OPERATIONS RECORDER DUMPED**

In Orbiter Processing Facility Bay 1, technicians are processing Columbia which has just returned from its STS 50 mission. The Payload Operations Recorder has been dumped and the United States Microgravity Laboratory-1 was removed yesterday. The USML-1 arrived at the Operations & Checkout Building at 11:45 a.m. today. Work in progress: preparations to deservice residual hypergolic propellants; inspections of the radiators; post-flight inspections of the windows and main engines. In OPF Bay 2, technicians are processing Discovery and are engaged in these activities: tests of the waste containment system; leak checks of the auxiliary power unit system; preparations to install the left orbital maneuvering system (OMS) pod; leak and functional tests of the main propulsion system; filling and bleeding of the hydraulic system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 17, 1992;Banke, FLORIDA TODAY, p. 2A, July 18, 1992.]

July 20: **ENDEAVOUR GETS ENGINES TODAY**

In OPF Bay 3, workers will begin installing Endeavour's engines; meanwhile workers at Launch Complex 39B continue to prepare Atlantis for its July 31 launch of the STS 46 mission. Closeouts of Atlantis's rear engine compartment begin today as well as stowing two spacesuits in the Orbiter's airlock. ["KSC to Install Engines on Endeavour Today," FLORIDA TODAY, p. 4A, July 20, 1992.]

STS 46: PRE-LAUNCH ACTIVITIES

Close outs of the aft compartment and avionics bays of Atlantis are underway at Launch Complex 39B in preparation for the July 31 liftoff of STS 46. Other work in progress: cleaning of the aft compartment; power up testing; retest of the pilot's CRT monitor; installation of two contingency space suits in the airlock. Work scheduled: purges of the external tank; installation of the doors on the aft compartment for flight next week. The launch countdown for STS 46 begins at 4 p.m. on July 28 with liftoff coming at 9:56 a.m. EDT July 31. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 20, 1992.]

SPACELAB-J TESTS COMPLETED/ENDEAVOUR

In Orbiter Processing Facility Bay 3, technicians have completed interface verification tests between Spacelab-J and Endeavour; the Spacelab tunnel was installed yesterday and freon coolant loop No. 1 was serviced. Work in progress: installation of the three main engines for STS 47; preparations for crew equipment interface test; hookups of the waste containment system; securing the right hand wheel to the landing gear. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 20, 1992.]

COLUMBIA/DISCOVERY PROCESSING

Residual hypergolic propellants have been drained from Columbia this weekend in OPF Bay 1 where the Orbiter is being processed for its STS 52 mission. Work in progress: disconnecting equipment used to deservice hypergolic propellants and removing thermal blankets around the extended duration Orbiter (EDO) pallet. The pallet is scheduled to be removed July 22. Discovery continues processing activities looking toward its STS 53 mission for the Department of Defense. In he Hypergolic Maintenance Facility tests are underway on Discovery's forward reaction control system and the left orbital maneuvering system pod. Leak checks are being conducted on the Orbiter's auxiliary power unit system; preparations have begun to install the left orbital maneuvering system (OMS) pod; leak and functional tests of the main propulsion system and filling and bleeding of the hydraulic system have also started. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 20, 1992.]

GOLDIN: RUSSIAN INITIATIVES

Following a 7-day trip to Russia and the Ukraine, NASA Administrator **Daniel S. Goldin** today announced plans for the United States and Russia to implement the agreements Presidents Bush and Yeltsin announced on June 17, 1992. The Administrator said significant progress was made in developing a plan to carry out a wide range of projects in concert with the Russian space program, including expansion of cooperation in life sciences and global change research, the exchange of an American astronaut and Russian cosmonaut, and a Space Shuttle rendezvous and docking with the Russian Mir space station. "In our relationship with Russia, we need to start slowly and deliberately

to build a strong foundation of cooperation," Goldin said. "In this way, we will ensure that what we do together will be successful, both technically and scientifically."

Goldin said much had been learned on the interagency trip, which was jointly led by National Space Council Executive Secretary **Brian Dailey**, and which was agreed upon by Vice President Quayle and President Yeltsin in a meeting last month. The delegation included Assistant Secretary of the Air Force **Martin Faga** and representatives from the National Security Council, State Department and the Central Intelligence Agency. "The delegation had the opportunity to take a closer look at Soyuz-TM, the Russian Docking System and at their human spaceflight operation," Goldin said. "We also learned a lot about the capabilities of the Mir space station and discussed ways to expand critical life sciences and global change research."

Goldin said both the United States and Russia agreed to encourage private companies to expand their research for new commercial space business and agreed to facilitate appropriate contacts. Both countries also agreed that the docking mission planned in 1994 with Russia would highlight biomedical science. NASA and the Russian Space Agency agreed - pending an appropriate review and approval of the governments of the two countries - to continue the activities now underway by the five working groups established under the 1987 joint agreement with the Russian Academy of Sciences. Additional initiatives will be undertaken by the Working Group of Space Biology and Medicine which will now concern itself with life support systems.

The agreement also that the parties:

** study the possible use of Mir for long lead-time life sciences research;

** establish a new working group to develop a plan to enhance cooperation on global change research (Mission to Planet Earth);

** recommend cooperative biomedical research projects for future missions, including the missions involving exchange of a Russian cosmonaut and an American astronaut and the Space Shuttle/Mir rendezvous and docking mission;
** study the feasibility of further enhancing the biomedical capabilities of Mir using instruments from the U.S.; and

** study the possibility of closed-loop life support experiments with humans over different periods of time and to define the requirements for long duration missions.

Goldin said he also discussed the acquisition by the United States of a small Russian lander to carry U.S. experiments that would be one of three landers flown on the Russian Mars '94 mission. The Russian and Ukraine trip followed a series of meetings between President Bush and Yeltsin during the June summit in Washington when they discussed a series of space initiatives. At the summit, Bush and Yeltsin signed the Joint Statement on Cooperation in Space. Goldin and **Yuri Koptev**, Director of the Russian Space Agency, also ratified the 1992 United States-Russian Space Cooperation Agreement. [NASA/KSC News Release No. 92-116, July 20, 1992; "1993 Shuttle May Carry Russian," THE ORLANDO SENTINEL, July 17, 1992; "Officials: Russian May Fly On Shuttle By October '93," FLORIDA TODAY, July 17, 1992.]

July 21: **PILOT'S CRT RETESTED**

At Launch Complex 39B, technicians have tested the STS 46 Pilot's replacement monitor. Work in progress on Atlantis: installation of the repaired electronics assembly for the EOIM payload environmental monitoring package; closeouts of the aft compartment and avionics bays; power up testing; retest of the Pilot's CRT; installation of two contingency space suits in the Orbiter's airlock. Work scheduled: purges of the external tank; installation of doors on the aft compartment for flight this week; the start of the launch countdown is still planned for 4:00 p.m. EDT July 28 with launch on July 31 at 9:56 a.m. EDT. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 21, 1992; Banke, FLORIDA TODAY, p. 2A, July 22, 1992.]

STS 47: ENDEAVOUR PROCESSING

In Orbiter Processing Bay 3, technicians have installed engine No. 2026 in the number 1 position on Endeavour and aligned the Spacelab tunnel adapter. Work in progress: installing engine No. 2022 in the number 2 position; preparations for crew equipment interface test; hookups of the waste containment system; leak and functional testing of the auxiliary power system; installation of seep stations. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 21, 1992.]

COLUMBIA: RADIATOR TESTS COMPLETED

In OPF Bay 1, technicians have finished functional tests of Columbia's radiators and will be removing the extended duration Orbiter (EDO) pallet on July 22. Presently, workers are removing thermal blankets around the EDO; removing heat shields and removing window number 4. Meanwhile, in the Hypergolic Maintenance Facility, technicians are conducting tests of Discovery's forward reaction control system and the left orbital maneuvering system pod. In OPF Bay 2, workers are conducting leak checks of the auxiliary power unit system; preparing to install the left orbital maneuvering system (OMS) pod on July 23; leak and functional tests of the main propulsion system; hydraulic system testing; leak checks of the galley; painting areas of the midbody. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 21, 1992.]

July 22: **STS 46: SPACE SUITS INSTALLED**

Two contingency space suits have been installed in the airlock of Atlantis as it awaits launch at Launch Complex 39B; workers have also installed baggies on the engine low pressure fuel ducts. Work in progress: stowing equipment in the crew module; retest of the repaired electronics assembly for the EOIM payload environmental monitoring package; closeouts of the aft compartment and the avionics bay of Atlantis. Work scheduled: purges of the external tank; final ordnance operations on July 24; installation of aft compartment doors on July 23; countdown scheduled to begin at 4:00 p.m. July 28 and the STS 46 crew arrives at 7:30 p.m. Launch remains slated for July 31 at 9:56 a.m. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 22, 1992.]

ENDEAVOUR: MAIN ENGINES INSTALLED

In preparation for its upcoming STS 47 mission, Endeavour has had its three main engines installed during processing activities in OPF Bay 3. Work in progress: connections of the three main engines; preparations to install the Spacelab tunnel; preparations for crew equipment interface test; leak and functional testing of the auxiliary

power units; installation of sleep stations. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 22, 1992.]

STS 52/53 PROCESSING ACTIVITIES

The Space Shuttle Columbia is being processed in OPF Bay 1. Work in progress: removing the extended duration Orbiter (EDO) pallet; removal of heat shields; removal of window no. 4. Discovery, located in OPF Bay 2, also has a number of processing activities underway: tests of the forward reaction control system and the left orbital maneuvering system pod; leak and functional tests of the main propulsion system; hydraulic system testing; leak checks of the galley; painting areas of the midbody. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 22, 1992.]

ELECTRONICS ASSEMBLY PASSES RETEST

At Launch Complex 39B, a repaired electronics assembly in an experiment package passed its retest; the experiment is stored aboard Atlantis for its STS 46 flight. Last week, engineers were not able to determine whether the device was turning on or off properly. KSC spokeswoman **Lisa Malone** said today that the part had been cleared for the July 31 flight if Atlantis. Halvorson, FLORIDA TODAY, p. 8A, July 23, 1992.]

GEOTAIL LAUNCH

"We're right on schedule," said Jim Womack, NASA's Director of Unmanned Launch Vehicle Operations at Kennedy Space Center. The launch of the Geotail spacecraft aboard a Delta II rocket is scheduled for Friday, July 24. The launch window - only five minutes in duration - extends from 10:26 to 10:31 a.m. EDT. [NASA/KSC News Release No. 96-92, July 22, 1992; Banke FLORIDA TODAY, p. 1A, July 24, 1992; "Delta 2 Blasts Off," FLORIDA TODAY, pp. 1A & 6A, July 25, 1992.]

GOLDIN MEMO TO NASA EMPLOYEES

You may have read or heard about an article that recently appeared in the media, falsely claiming there is a plan to make 500 high level reductions in the workforce (RIFs) at NASA headquarters on August 1, 1992. For the record, the news article is completely false. I believe it may have originated from proposed legislation in Congress to reduce NASA's Research and Program Management (R & PM) funding for FY 1993. I was asked at a press conference to comment on the news story and responded forcefully: "That (the news story) is absolutely, positively not true. I don't know who came up with that, but they are off on a tangent. There are not plans to have a RIF at NASA headquarters and this Administrator is going to fight to retain a reasonable amount of R & PM funds so we don't have to have a RIF." [**Goldin**, "Memorandum to All NASA Employees," July 22, 1992.]

July 23:

PCC TO BE DEDICATED

NASA's Kennedy Space Center will next week host a dedication ceremony for the recently constructed Space Shuttle Processing Control Center (PCC). The event will take place at 9 a.m. July 29. The PCC is a three-story, 99,000-square-foot facility dedicated to Space Shuttle Orbiter testing, launch team training and Launch Processing System (LPS) maintenance. The building houses control rooms for Orbiter processing and will provide

Space Shuttle engineers and technicians with state-of-the-art areas to improve and maintain their skills during pre- and post-flight Orbiter processing flows.

Each of the PCC's three floors is designed to serve a specific purpose. The facility's first floor consists of offices, workshops and laboratories for the maintenance and testing of LPS and related equipment. The second floor contains additional office space and areas for launch team training and computer software production. Orbiter control rooms dominate the PCC's third floor. The ceremony's featured speakers will include KSC Director **Robert L. Crippen**, KSC Director of Shuttle Management and Operations **Jay Honeycutt** and **James Towles**, KSC's Director of Facilities Engineering and Project Management. The PCC is located in the Launch Complex 39 area, between the Orbiter Processing Facility and the Operations Support Building. The $8.9 million building was designed and built by The Haskell Company (Jacksonville, FL); construction of the facility began on May 29, 1991. [NASA/KSC News Release No. 99-92, July 23, 1992.]

July 24:

STS 46: FINAL ORDNANCE OPERATIONS

In preparation for the STS 46 launch, technicians at Launch Complex 39B have completed final ordnance operations, purged the external tank of Atlantis and installed the doors on the aft compartment for flight. Work in progress: closeouts of the payload; closeouts of ordnance areas on the vehicle; stowing equipment in the crew module; launch countdown preparations. Pressurization of the hypergolic propellant tanks for launch has been scheduled. The launch countdown is set to begin at 4 p.m. EDT July 28; the STS 46 crew is expected to arrive at KSC at 7:30 p.m. EDT. Launch remains set for 9:56 a.m. EDT. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 24, 1992; "KSC to Finish Work on Explosives," FLORIDA TODAY, p. 4A, July 24, 1992.]

COLUMBIA: WINDOW #6 REMOVED

In OPF Bay 1, technicians have removed the heat shields from Columbia and have removed window number 6. Technicians are inspecting the Orbiter's main engines and making post-STS 50 inspections of the vehicle's radiators. In OPF Bay 1, work in progress for the upcoming STS 47 flight of Endeavour includes: connections of the three main engines; installation of the Spacelab tunnel; preparations for crew equipment interface test; tests of the Ku-band and Tacan antennas; installation of sleep stations. In OPF Bay 2, technicians are preparing to install the left orbital maneuvering system pod in Discovery. Other work in progress: leak and functional test of the main propulsion system; filling and bleeding of the hydraulic system testing; painting areas of the midbody; leak and functional testing of the auxiliary power units. Scheduled: installation of the left orbital maneuvering system pod this weekend and installation of the three main engines starting on August 3. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 24, 1992.]

ADMINISTRATOR REFORMS PROCUREMENT PROCESS

NASA Administrator **Daniel S. Goldin** today announced a series of procurement reforms to make NASA the model of excellence for the Federal Government and ensure Americans receive the very best value for their tax dollar. "Through a focus on the customer, empowerment, teamwork with our partners in industry, accountability and diversity, we can achieve our goal and serve as a beacon to others," Goldin said in a speech to the National Contract Management Association in Los Angeles. Goldin said reforms in NASA's procurement process are necessary because 90 percent of the budget is spent through contracts.

"We must continue to give the American people technical advances, but we must also give them 'best' value for their tax dollar," the Administrator said. "In the future, NASA will not tolerate 300 percent cost overruns, defective spacecraft hardware or the failure to follow work instructions that protect government furnished hardware. Nor will we tolerate schedule slippages. We can't keep letting months turn into years and years into decades." According to Goldin, the current procurement system teaches people to fear making any mistakes. "Everyone involved in the acquisition process is swimming in certifications. Instead, we should be encouraging innovation, creativity and efficiency." He said NASA and contractor personnel will never achieve excellence if they are not given clear lines of responsibility and held accountable for their decisions.

Major changes in the procurement process include:

*New contracts will be awarded to companies that have demonstrated they are accountable by delivering quality systems that meet cost, schedule and technical requirements; and

*The amount of the award fee earned will be determined by the end result, namely the quality, timeliness and cost of what is delivered;

*Contractors will be given greater responsibility for success of a program, and should be given the opportunity for increased award fee if they hold to schedule, keep the program within cost estimates and deliver a satisfactory report.

To determine a contractor performance, Goldin said NASA will soon establish a joint NASA-industry team to develop a source of "metrics" or measurements. "Once the metrics are established, NASA will publish the results on a generic basis, without identifying specific contractors. On a semi-annual basis, we will notify each CEO where their company stands," Goldin said. Finally, Goldin said NASA will aggressively promote cultural diversity in the work place and reaching its goal for Small and Disadvantaged Business (SDB) contracts. "As Administrator of NASA, I have made a personal commitment to increasing cultural diversity in the workplace and to increasing the contracting opportunities for small and disadvantaged contracts," Goldin said.

The Administrator said NASA had implemented a range of initiatives to increase the number of SDB contracts, including:

*SDB considerations are part of NASA's earliest procurement planning, and are emphasized in acquisition strategy meetings or in procurement plans; and

*In many of NASA's large prime contracts, NASA is establishing firm percentages of the effort to be subcontracted to SDBs and will reward those contractors with special incentive fees when they exceed the SDB requirement.

"Small and disadvantaged businesses need assistance above and beyond set-asides," Goldin said. "In the coming months we will be setting up a new 'minority business resource advisory committee' in NASA to help us bring more SDB contractors into the NASA family," he said. "Each of us as professionals and as citizens has an obligation to help overcome the barriers that divide us as a nation. The Los Angeles riots were visual proof that we must redouble our efforts to help our minority citizens turn their dreams into realities," Goldin concluded. [NASA/KSC News Release No. 92-123, July 24, 1992; NASA/KSC News Release No. 92-123A, July 27, 1992.]

July 25: ATLANTIS THERMOSTAT FIXED

Workers at Launch Complex 39B today repaired a thermostat located in the aft compartment of the Space Shuttle Atlantis which is awaiting the start of its STS 46 mission on July 31. The thermostat is part of a heater for one of the Orbiter's three APUs. The faulty thermostat was detected after workers had sealed the aft compartment and were conducted a last test of the section, according to Kennedy Space Center spokesman **Bruce Buckingham**. Officials anticipated no delay in the schedule for launch at 9:56 a.m. EDT July 31. The STS 46 crew includes Commander **Loren J. Shriver**, Pilot **Andrew M. Allen**, Mission Specialists **Claude Nicollier, Marsha S. Ivins, Jeffrey A. Hoffman** and **Franklin R. Chang-Diaz** and Payload Specialist **Franco Malerba** of Italy. [Banke, FLORIDA TODAY, p. 2A, July 26, 1992.]

July 26: TSS-1 HAS ORDNANCE INSTALLED

At Launch Complex 39B, technicians have installed explosive devices on the Tethered Satellite System now located in the cargo bay of Atlantis. The ordnance will enable astronauts aboard the STS 46 mission to deploy the TSS-1, an Italian-made spacecraft which is designed to demonstrate the use of a tether to generate electricity. [Brown, FLORIDA TODAY, p. 1A, July 27, 1992.]

July 27: STS 46: THERMOSTAT RETESTED

Workers re-entered the aft compartment of Atlantis July 25 to replace and retest a heater thermostat for auxiliary power unit number 3. The flight doors were re-installed on the aft compartment for flight July 26; batteries were installed for the Tethered Satellite and they hypergolic propellant tanks were pressurized for launch. Work in progress: verifying the hazardous gas detection system at Launch Complex 39B; closeouts of the payload; stowing equipment in the crew module; launch countdown preparations; washdown of the pad surface and flame trench. The countdown for STS 46 is set to begin at 4 p.m. EDT tomorrow and the crew will arrive later, at about 7:30 p.m. NASA spokeswoman **Lisa Malone** said, "The team spent several months getting Atlantis ready to fly. We're going to be real excited getting into the countdown, and we're really looking forward to launch on Friday. Launch remains targeted for July 31 at 9:56 a.m. EDT. NASA Lead Flight Director **Charles "Chuck" Shaw** said, "This will probably be the most unique mission we've ever flown on the Space Shuttle, and arguably the most complex mission that we've ever flown. This mission has provided us with an awful lot of challenges, but I think we've risen to the occasion. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 27, 1992; Halvorson, FLORIDA TODAY, p. 1A, July 28, 1992.]

[] ENDEAVOUR: CEIT COMPLETED

Endeavour's Crew Equipment Interface Test for STS 47 has been completed and the Spacelab Tunnel has been installed in the Orbiter. Work in progress: leak checks of the main engines and main propulsion system; leak tests of the Spacelab Tunnel; inspections of the radiators; installation of the sleep stations. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 27, 1992.]

[] COLUMBIA & DISCOVERY: PROCESSING STATUS

In OPF Bay 1, technicians have deserviced lube oil from Columbia's auxiliary power units and are preparing the Orbiter for removal of the forward reaction control system and for

post-STS 50 inspections of the radiators. In OPF Bay 2, workers have installed Discovery's left orbital maneuvering system pod and deserviced the freon coolant loops. Work in progress on OV 103: installation of main engine number 1; final connections of the left orbital maneuvering system pod; filling and bleeding of the hydraulic system; leak and functional tests of the auxiliary power units. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 27, 1992.]

July 28: **STS 46: LAUNCH MINUS THREE DAYS**

As the countdown for STS 46 starts today, NASA Lead Flight Director Charles "Chuck" Shaw said, "This will probably be the most unique mission we've ever flown on the Space Shuttle, and arguably the most complex mission that we've ever flown. This mission has provided us with an awful lot of challenges, but I think we've risen to the occasion. It's probably going to usher in a new way of doing business in Earth Orbit." The STS 46 crew is expected to arrive about 7:30 p.m. tonight. KSC spokeswoman Lisa Malone said, "The team's spent several months getting Atlantis ready to fly. We're going to be real excited getting into the countdown, and we're really looking forward to launch on Friday (July 31)."

The pad surface and flame trench at Launch Complex 39B have been washed down in preparation for the STS 46 launch of Atlantis, July 31. Work in progress: closeouts of the payload and charging the batteries of the EURECA payload; stowing equipment in the crew module; removing covers from the reaction control system thrusters; launch countdown preparations. Work scheduled: closing the payload bay doors for flight at about 5 a.m. July 29; loading of cryogenic reactants into the Orbiter's onboard fuel cell storage tanks in the afternoon of July 29; beginning tanking operation at 1:36 a.m. on July 31; launch at 9:56 a.m. EDT. There is a 90 percent chance of having acceptable weather conditions at the time of launch; the temperature is expected to be 91 degrees and no rain is forecast. [Halvorson, FLORIDA TODAY, p. 1A, July 28, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., July 28, 1992; Date, THE ORLANDO SENTINEL, July 29, 1992; Wilford, THE NEW YORK TIMES, pp. B5 & B7, July 28, 1992.]

ENDEAVOUR: GALLEY TEST COMPLETED

A functional test of Endeavour's galley has been completed as have leak tests of the Spacelab Tunnel. Work in progress: preparation to flush the ammonia system; replacement of the mission elapsed timer; leak checks of the main engines and main propulsion system; functional test of the radiators and installation of the sleep stations. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 28, 1992.]

STS 52: PREPARATIONS CONTINUE ON COLUMBIA

The Space Shuttle Columbia continues to be processed for its next mission - STS 52. Work in progress: preparations to remove the forward reaction control system; post-STS 50 inspections of the radiators; removing fuel cell No. 2; leak and functional tests of the main propulsion system. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 28, 1992.]

DISCOVERY: MAIN ENGINE NO. 1 INSTALLED

Main engine number 1 has been installed in Discovery and the left orbital maneuvering system pod has been electrically mated to the Orbiter. Work in progress: installing main engine number 3; tests of the Tacan system; preparations to install the forward reaction

control system; filling and bleeding of the hydraulic system; leak and functional tests of the auxiliary power units. The installation of the No. 3 main engine and the forward reaction control system have been scheduled. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 28, 1992.]

FIRST PERSONAL COMPUTER CONTRACTS AWARDED

Kennedy Space Center has awarded first-of-a-kind contracts to three firms under NASA's Personal Computer Acquisition Contract Program. Throughout the 5-year life of the contracts, the three companies must compete against each other for NASA orders to supply personal computer (PC) hardware and software to Kennedy Space Center and other NASA locations. The companies are General Technology, Inc. (Costa Mesa, CA); Atlanta Technologies, Inc. (Atlanta, GA); and International Data Products Corp. (Gaithersburg, MD). The contract period of performance is from July 2, 1992, to July 1, 1994, with three additional 1-year optional periods.

Under the terms of the fixed price contract, all three companies will receive portions of a $37,674,000 award, with a minimum amount of $180,000 going to each firm. The actual purchases of PC hardware and software depend on which small business company is able to provide the lowest prices and best performance during a quarterly time period. Although vendors may renegotiate current prices every 3 months, they cannot increase prices above the contract negotiated prices and they must furnish current technology items. NASA has established this competitive arrangement so that the agency can be assured of a steady supply of high-quality products for the best price. Kennedy Space Center will purchase computers and software under this contract to be used in a variety of technical and administrative support functions. Other NASA centers and organizations also may order PC equipment and software through the KSC-managed contract. [NASA/KSC News Release No. C92-10, July 28, 1992.]

July 29:

STS 46: LAUNCH MINUS TWO DAYS

The flight crew for STS 46 arrived at Kennedy Space Center yesterday at 9:15 p.m., not quite two hours later than expected. The launch countdown began at 4:00 p.m. as planned. The main engine controllers were powered up for pre-launch tests; the Orbiter's navigation system was activated; preparations were begun to load liquid oxygen and liquid hydrogen reactants into the Orbiter's fuel cell storage tanks. Today the crew performed checks of their flight equipment and were briefed on the status of launch readiness. Commander **Loren J. Shriver** and Pilot **Andrew M. Allen** flew in the Shuttle Training Aircraft. Forecasters predicted a 95 percent chance of having acceptable weather conditions at the time of launch on July 31; the temperature is expected to be at 85 degrees with no rain. Work in progress: verification of six electrical connectors between Atlantis and the Tethered Satellite System pallet; removing platforms from the crew module; countdown entered its first hold on time. Work scheduled: closing the payload bay doors for flight this afternoon; loading reactants; activating the Orbiter's communications system; tanking operations beginning at 1:36 a.m. July 31. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 29, 1992; Banke, FLORIDA TODAY, July 29, 1992; Banke, FLORIDA TODAY, July 30, 1992; Banke, FLORIDA TODAY, p. 1A, July 29, 1992.]

ENDEAVOUR: RADIATOR TEST FINISHED

Endeavour's radiator functional test was completed today; interface testing between the main propulsion system and the main engines was also finished. Work in progress: flushing of the ammonia system; retesting the mission elapsed timer; leak checks of the main engines and main propulsion system; functional tests of the radiators; installation of the sleep stations. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 29, 1992.]

COLUMBIA: FUEL CELL 2 REPLACED

The number 2 fuel cell of Columbia has been replaced during processing activities in OPF Bay 1. Work in progress: preparations to remove the forward reaction control system; post-flight (STS 50) inspections of the radiators; leak and functional tests of the main propulsion system and replacement of the number 3 fuel cell. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 29, 1992.]

DISCOVERY: MAIN ENGINES INSTALLED

Workers processing Discovery in OPF Bay 2 have installed the Orbiter's three main engines. Work in progress: connections of the main engines; preparations to install the heat shields around the engines; tests of a thruster on the left orbital maneuvering system pod; preparations to install the forward reaction control system; filling and bleeding of the hydraulic system; leak and functional tests of the auxiliary power units. The forward reaction control system has been scheduled for installation in Discovery. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 29, 1992.]

July 30:

STS 46: LAUNCH DAY MINUS ONE

Technicians at Launch Complex 39B successfully verified six electrical connections between the Orbiter and the Tethered Satellite System pallet. They closed the payload bay doors of Atlantis at 4:50 p.m. July 29; loaded liquid oxygen and liquid hydrogen reactants into Atlantis' fuel cell storage tanks by midnight last night and activated the Orbiter's communications system. Work in progress: the countdown for launch entered a planned built-in hold at 8 a.m. at the T-11 hour mark and the count picked up again at 7:36 p.m.; relieved a small pressure build-up from auxiliary power unit number 3 in the aft compartment; prepared to move the rotating service structure away from Atlantis between 6 and 7 p.m.; stowed critical items in the crew cabin; configured switches on the flight deck for launch; filled the sound suppression system water tank. Work scheduled: begin tanking operation at 1:36 a.m. July 31 looking toward a 9:56 a.m. launch tomorrow.

Associate NASA Administrator **Jeremiah W. Pearson, III,** said, "If we get the satellite out and get the data, that's success. If we get the satellite back, we're heroes. The crew members continued their preparations for launch day. Commander of the crew is **Loren J. Shriver** and the pilot is **Andrew M. Allen.** Mission Specialists are **Claude Nicollier** from the European Space Agency, **Marsha S. Ivins, Jeffrey A. Hoffman** and **Franklin R. Chang-Diaz.** The Payload Specialist is **Franco Malerba** from the Italian Space Agency. Earlier today, the crew was briefed on the status of launch readiness and weather conditions; they also flew in T-38 trainers this morning. Forecasters put the chance of launch at 95%. [KSC SHUTTLE STATUS REPORT, 10 a.m., July 30, 1992; Wilford, THE NEW YORK TIMES, p. A12, July 31, 1992.]

ASBESTOS IN 90% OF KSC BUILDINGS

NASA's Inspector General's office has issued a report which says that asbestos, in one form or another, is found in 90% of the buildings at Kennedy Space Center. "It will not stop us from launching Shuttles," said **Burt Summerfield**, NASA Pollution Control and Sanitation Officer. "We have the people trained and appropriately equipped to deal with whatever repair or removals would be necessary to deal with asbestos problems as they arise." He said that, as far as he was aware, there were no worker complaints concerning asbestos-related health problems. ["Asbestos Problems Could Cripple KSC, Report Says," THE ORLANDO SENTINEL, p. 1A, July 31, 1992.]

GOLDIN: SPACE STATION VOTE IN CONGRESS

Today, NASA Administrator **Daniel S. Goldin** issued a statement on Congress's action concerning the Space Station Program: "The American people won a great victory this week as the House of Representatives voted to continue building Space Station Freedom. As I listened to the debate in the House Chamber and watched the vote tally grow, I was proud that in these difficult economic times, Congress saw the wisdom in investing in our future. This successful vote would not have been possible without the dedication and hard work of many: NASA employees at the headquarters and centers, our contractor teammates, and many other concerned Americans who recognize the importance of extending human presence in space.

President **Bush** wrote a strong letter in support of Space Station Freedom, and Vice President **Quayle** made numerous phone calls to undecided congressmen. It was not just a victory for NASA, but for a nation that desperately needs the research and technology that will come from a permanent facility in space. Even the Space Station's opponents sent us a useful message. Many of them support the space program, but have become concerned over the years with overruns, slipped schedules, and mission failures. In building Space Station Freedom, we must make it the hallmark of the new NASA -- a NASA that does things better, faster, and cheaper -- without compromising safety. Freedom represents our toughest engineering and operational challenge to date. So we must make extra efforts to bring this project in on time and on budget. Only through a commitment to total quality and continuous improvement can we prove that the magic is back at NASA.

The American people have made a big investment in Space Station Freedom, and they expect a big return. They look to NASA for inspiration, hope, and opportunity. Now it's time to deliver like never before. With the experience and knowledge gained from the Space Station, we'll be ready to go back to the Moon and start exploring Mars. Lincoln said, "The struggle of today is not altogether for today -- it [is] for a vast future also." I believe we will continue to be bold and keep reaching out. We will never give up the quest of exploration. That is our dream. That is our desire. And that is our destiny. Again, thanks to everyone who helped keep the dream alive. [Goldin, "Memorandum for All NASA and KSC and JPL Employees," July 30, 1992; "House Spares Space Station," FLORIDA TODAY, pp. 1A-2A, July 30, 1992; Holton, THE ORLANDO SENTINEL, pp. A-1 & A-6, July 30, 1992.]

July 31:

TEACHERS COMPLETE NASA WORKSHOP

Twelve junior high and high school teachers from Brevard County schools recently completed the two-week NASA-Brevard Links Academic Skills with Technology (NASA-

BLAST) workshop held at John F. Kennedy Space Center July 20-31. The teachers were selected for the workshop by the Brevard County School System. The NASA-BLAST program provides an in-depth opportunity for these instructors, who teach mathematics, science and technology to grades 7-12, to learn more about space science and technology. While at KSC, they work directly with agency engineers and scientists. NASA-BLAST is also designed to inform teachers about NASA's educational programs and materials.

The NASA-BLAST program participants were: Dr. **Alexandra Penn**, program coordinator, Cocoa High School; **Rachel Capers** and **James Pugh**, both of Titusville High School; **Michael Deane**, Southwest Junior High School, Palm Bay; **William Hausman**, Roosevelt School, Cocoa Beach; **Sara Jones**, **Janice Robinson** and **Cheryl Warren**, Merritt Island High School; **Cora Knighton**, John F. Kennedy Middle School, Rockledge; **James LaCoy**, Astronaut High School, Titusville; **Celeste Rossi**, Edgewood Junior High School, Merritt Island; and **Deborah Ann Wilson**, Andrew Jackson Middle School. Another integral part of the workshop is a session in which the teachers from the three disciplines work together to develop classroom programs that combine elements of their respective teaching fields. By using this approach, a technology instructor, for example, will be able to teach some math and science. This combination of curricula will help to provide a broader education for the students. On the first day of the workshop, the NASA-BLAST group was welcomed by KSC Deputy Director Gene Thomas, Jay F. Honeycutt, Director of Shuttle Management and Operations, explained how the Shuttle and its payloads are processed and launched at the Center. [NASA/KSC News Release No. 100-92, July 31, 1992.]

STS 46: 40 SECONDS LAUNCH DELAY

Atlantis was launched this morning at 9:56:48.0684 a.m. EDT. Liftoff was delayed about 40 seconds as the countdown clock held briefly at the T minus 5 minute mark while the Orbiter's computers verified that the cockpit switches for the auxiliary power units were in the proper configuration to start the APUs. NASA Launch Director **Brewster H. Shaw, Jr.** said, "It was really a piece of cake countdown, so to speak." The small delay in launching kept Atlantis from being the first Space Shuttle since Challenger to have an on-time liftoff. Very little pad damage was reported from the launch. Both solid rocket boosters were to be towed to Hangar AF on Cape Canaveral Air Force Station on August 1. Landing of Atlantis is planned for Kennedy Space Center's Shuttle Landing Facility on August 7 at 8:09 a.m.EDT. [Banke, FLORIDA TODAY, p. 4A, July 31, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 3, 1992; Banke, FLORIDA TODAY, pp. 1A-2A, Aug. 1, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-8, Aug. 1, 1992.]

AUGUST

August 1: **EG&G MANAGEMENT CHANGES**

When NASA's Center Support Operations Directorate changed its management structure, EG&G Florida, Inc. (Base Operations Contractor) reacted. "We changed our management structure to conform with theirs," said company spokesperson **Beth Hall**. EG&G promoted an Associate General Manager, **John Pruden**, to be Deputy General Manager. Pruden was replaced by **James Parker**, formerly of Johnson Controls World Services Inc. (Titusville, FL). **Jerry Jorgensen** has moved from manager of technical operations to Associate General Manager of Propellants and Environmental Services. EG&G Florida Inc. is competing this year for the $1.5 billion Base Operations Contract which Kennedy Space Center will award at the end of the year. Also competing are Johnson Controls; Lockheed Space Operations Co.; BAMSI and Jacobson Engineering (Lakeland, FL). [Liden, FLORIDA TODAY, p. 12C, Aug. 1, 1992.]

PROCESSING CONTROL CENTER DEDICATED'

Kennedy Space Center Director **Robert L. Crippen** today dedicated the new three-story Processing Control Center. The new $11.3 million building houses offices, workshops and laboratories to maintain and test equipment needed to prepare and launch Shuttles. The 99,000-square-foot building is at Launch Complex 39, adjacent to the Vehicle Assembly Building. ["KSC Dedicates Shuttle Building," FLORIDA TODAY, p. 10E, Aug. 2, 1992.]

August 3: **ENDEAVOUR: HEAT SHIELDS INSTALLED**

In Orbiter Processing Facility Bay 3, technicians have installed heat shields around the main engines of Endeavour as processing activities for the upcoming STS 47 mission continue. Work in progress: pressure decay check between the Spacelab and Orbiter; minor repairs of the radiators; installation of sleep stations; preparations to service the ammonia system. Rollover to the Vehicle Assembly Building is targeted for August 17; Endeavour will be mated to its external tank and solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m., August 3, 1992.]

COLUMBIA: FUEL CELLS 2 & 3 REPLACED

Fuel cells number 2 and 3 have been replaced on the Space Shuttle Columbia during its stay for processing in OPF Bay 1. Work in progress: preparations to replace a thruster on the left orbital maneuvering system (OMS) pod; preparations to remove the three main engines; inspections of the radiators. [KSC SHUTTLE STATUS REPORT, 10 a.m., August 3, 1992.]

DISCOVERY: PROCESSING ACTIVITIES/OPF BAY 2

Technicians have installed and electrically mated the forward reaction control system in Discovery during processing in OPF Bay 2. The left orbital maneuvering system (OMS) pod has also been removed. The pod will be transferred to the Hypergolic Maintenance Facility so work may be performed on a faulty connector. Work in progress: preparations to close the payload bay doors; closeouts of the Orbiter; preparations to move to the VAB. Transfer of Discovery to the Vehicle Assembly Building High Bay 2 will occur August 6 for about 10 days to allow room for Atlantis' post-mission checkout. Discovery

will then move into OPF Bay 3 after Endeavour is transferred to the VAB later this month. [KSC SHUTTLE STATUS REPORT, 10 a.m., August 3, 1992.]

MARS OBSERVER MATED TO TOS

The Mars Observer spacecraft was successfully mated today to its upper stage, the Transfer Orbit Stage (TOS), passing a major schedule milestone in processing. An Interface Verification Test (IVT) to verify the connections between the two flight elements is set for tomorrow (August 4). "As challenges in processing have come along, our teams have been willing to do what was necessary to have this milestone happen as close to schedule as possible," said **Glenn Cunningham**, Mars Observer Deputy Project Manager from the Jet Propulsion Laboratory. Later this week, the TOS will be fueled with its hydrazine attitude control propellant. Next week, closeout activities of the integrated payload stack will begin. The encapsulation into the Titan III nose fairing is scheduled for August 13, and the transfer from KSC's Payload Hazardous Servicing Facility to Launch Complex 40 for mating to the Titan III is targeted for August 17. All activities are currently on schedule for a liftoff of Mars Observer at the beginning of the planetary launch opportunity on September 16, 1992. The launch window extends from 1:02 p.m. to 2:34 p.m. EDT. The planetary launch opportunity ends on October 13. [NASA/KSC News Release No. 105-92, Aug. 3, 1992.]

August 5:

ATLANTIS TO LAND AT KSC

Atlantis has had its STS 46 landing at Kennedy Space Center rescheduled to occur on August 8 at 7:39 a.m. EDT at the Shuttle Landing Facility. Meanwhile, hydrolasing activities are continuing at Hangar AR to strip cork and foam away from the boosters. The mobile launcher platform was moved away from the launch pad to the parksite yesterday. [KSC SHUTTLE STATUS REPORT, 3:30 p.m., Aug. 5, 1992.]

ENDEAVOUR EXPERIENCING WATER LEAK

Technicians in OPF Bay 3 continue to troubleshoot a minute water leak of Endeavour to the Spacelab water loops. Other work in progress for the upcoming STS 47 mission includes: pressure decay checks between the Orbiter and Spacelab; minor repairs of the vehicle's radiators; installation of sleep stations; preparations to service the ammonia system. Work scheduled: rollover to the Vehicle Assembly Building now targeted for August 17 for mating with the external tank and solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 3:30 p.m., Aug. 5, 1992.]

COLUMBIA: LEFT OMS THRUSTER REPLACED

Workers in OPF Bay 1 are processing Columbia for its STS 52 mission; they have replaced a thruster on the left orbital maneuvering system pod. Work in progress: retest of the newly installed thruster on the left orbital maneuvering system pod; leak and functional tests of the auxiliary power units and inspections of the radiators. Discovery - in OPF Bay 2 - has undergone preparations to close its payload bay doors and to move the vehicle to the VAB. Technicians continue to work closing out the vehicle. Work scheduled: transfer to the VAB high bay 2 when the deorbit burn occurs for Atlantis to land in Florida at the SLF. This frees bay 2 for necessary post-flight deservicing operations on Atlantis. Discovery will remain in the VAB until Endeavour is transferred from bay 3 to the VAB later this month. [KSC SHUTTLE STATUS REPORT, 3:30 p.m., Aug. 5, 1992.]

August 7: **STS 46: CONCLUSION SET FOR KSC**

Landing of the Space Shuttle Atlantis's STS 46 mission is scheduled for tomorrow at 7:39 a.m. EDT at Kennedy Space Center's Shuttle Landing Facility (SLF). Weather conditions for tomorrow's landing call for possible scattered clouds and a chance of having rain within 30 nautical miles of the SLF. KSC's landing convoy team will be on station at 5:30 a.m. tomorrow at the midpoint of the runway; Atlantis will be towed to OPF Bay 2 several hours after landing. There is a second landing opportunity at KSC August 8 at 9:12 a.m., on orbit 127. Two landing opportunities are also available at KSC on August 9, at 7:21 a.m. and at 8:55 a.m.

The STS 46 solid rocket boosters are inside Hangar AF; both aft skirts have been removed and disassembly operations are set to begin next week. The pieces will be shipped to the manufacturers for refurbishment. Once Atlantis is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. For this mission and all following missions, a new transport vehicle will be used to assist the crew, allowing them to egress the vehicle and doff their launch and re-entry suits easier and quicker. This vehicle, called the Crew Transport Vehicle, or CTV, was purchased from Continental Airlines at Denver for use at KSC. A similar CTV is used to assist crew egress at the conclusion of missions landing at Edwards Air Force Base, CA.

The CTV and other KSC landing convoy operations have been in an "on call" status since the launch of Atlantis on July 31. The primary functions of the Space Shuttle Recovery Convoy are to provide immediate service to the Orbiter after landing, prepare the Orbiter for towing to the Orbiter Processing Facility and assist crew egress. Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits and communications checks are made. A warming of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and safely as possible once the Orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant Umbilical Access Vehicles move into position at the rear of the Orbiter.

Following the purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the Orbiter's port side. Once access to the vehicle is gained, a physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle. About 3 hours after landing, the Orbiter will be towed to Orbiter Processing Facility Bay 2 for post-flight deservicing. Preparations will also begin to ready Atlantis for its ferry flight later this year to Palmdale, CA, where it will be taken out of service for about one year while it undergoes scheduled modifications and refurbishments.

Following departure from the SLF, the seven astronauts will be taken to their quarters in the O & C Building, meet with their families, undergo additional physical examinations and depart for the skid strip at Cape Canaveral Air Force Station for their flight back to JSC. The crew plans to depart for JSC roughly 5 to 6 hours after landing. The exact time of departure will be determined following touchdown. In the event a landing at KSC is not feasible and Atlantis landed at Edwards, an augmented KSC convoy team will be at the California site to safe the vehicle, disembark the crew and move the Orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter

aircraft on landing day. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 7, 1992; NASA/KSC News Release Number 107-92, Aug. 7, 1992.]

[] ENDEAVOUR: PROCESSING ACTIVITIES CONTINUE

Endeavour is being readied for its September STS 47 mission in OPF Bay 3. Work in progress: servicing of the ammonia system; stowing of items in the Spacelab; continued troubleshooting of an air bubble in the Orbiter water lines connecting to the Spacelab module; cleaning of the payload bay; minor repairs of the radiators; installation of the sleep stations; closeouts of the vehicle. Work scheduled: interface verification system tests of the Spacelab; closure of the payload bay doors this weekend; structural leak checks of the Orbiter next week; rollover to the VAB targeted for August 17 for mating with the external tank and solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 7, 1992.]

[] DISCOVERY/COLUMBIA PROCESSING ACTIVITIES

Discovery is scheduled for transfer from OPF Bay 2 to the VAB high bay 2 when Atlantis's deorbit burn begins; the Orbiter will remain in the VAB until Endeavour is transferred from OPF Bay 3 later this month. Work in progress: preparations to move to the Vehicle Assembly Building; closure of the crew cabin hatch; closeouts of the vehicle. Columbia remains in OPF Bay 1 for processing activities: tests of the Orbiter's fuel cells; tests of the hydraulic flight control systems; functional tests of the external tank doors; leak and functional tests of the auxiliary power units; inspections of the radiators. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 7, 1992.]

August 8: ATLANTIS LANDS AT KSC

The STS 46 mission ended today where it began - at Kennedy Space Center. The seven member crew was greeted by astronaut **Jim Howell** who said, "Welcome to Florida and congratulations." Howell spoke to the crew from Mission Control in Houston, TX. Originally scheduled to land at KSC at 7:39 a.m.; the landing was delayed for one orbit due to threatening weather in Florida. The Orbiter's main gear touched down at 9:11:50 a.m. EDT at the space center's Shuttle Landing Facility, ending the 8-day journey. The total mission elapsed time to wheels stop was 7 days, 23 hours, 16 minutes and 10 seconds. The total distance Atlantis traveled was 3,321,007 miles. During this flight, which was extended one day, Atlantis made 127 orbits of the Earth. Atlantis was towed to OPF Bay 2 by 3 p.m. this afternoon for post-flight deservicing and inspections. Initial inspections indicate the vehicle fared well during the flight. An average number of tile dings were reported and the new tires were in very good condition. Continued inspections of the vehicle are planned this week including the tiles and main engines. Technicians are preparing to open the payload bay doors tomorrow and remove the Tethered Satellite System and EURECA hardware on August 12. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 10, 1992; Banke and Halvorson, FLORIDA TODAY, pp. 1A-2A, Aug. 9, 1992; Date, THE ORLANDO SENTINEL, p. A-3, Aug. 9, 1992; Banke, FLORIDA TODAY, p. 1A, Aug. 8, 1992.]

[] LOCKHEED: CUTS MINIMIZED DUE TO ATTRITION

Lockheed Space Operation Co. (Titusville, FL), through its spokesman J. B. Klump, minimized the impact of the expected cut of 266 employees by saying that all but 12 would leave through normal attrition, retirement or acceptance of early retirement. Klump

said, "We were not totally successful in our efforts (to minimize layoffs) because we did have to give letters to 12 people. But that's a whole lot better than it might have been." The layoffs were due to Congress's slashing of the proposed NASA budget. [Halvorson, FLORIDA TODAY, p. 10E, Aug. 9, 1992.]

August 9: **STS 47: LOADED WITH FIRSTS**

Endeavour's STS 47 mission will result in several milestones for the Space Shuttle Program. It will be the 50th mission. **Mark C. Lee** and **N. Jan Davis** will be the first married astronauts to fly on the same mission together. **Mae C. Jemison**, an MD, will be the first black woman astronaut to fly on an Orbiter. The first Japanese astronaut to fly aboard a Shuttle will be **Mamoru Mohri**; he will be involved in experiments aboard the Spacelab. Finally, Endeavour's second mission of its young flight career will mark the return to active status of **Robert L. "Hoot" Gibson**. The other two members of the crew will be **Curtis L. Brown, Jr.** and **Jay Apt**. [Banke, FLORIDA TODAY, p. 2A, Aug. 9, 1992.]

August 10: **ENDEAVOUR: STS 47 PROCESSING ACTIVITIES**

Interface verification system tests of the Japan-Spacelab and Endeavour have been completed. Closeouts of the Orbiter water cooling lines for the Spacelab have also been completed. Work in progress looking to a September launch of STS 47: final inspections of the payload bay; closing the payload bay doors; installation of sleep stations; closeouts of the vehicle. Work scheduled: structural leak checks of the Orbiter this week; weight and center of gravity determinations; rollover to the Vehicle Assembly Building is targeted for August 17 for mating with the external tank and the solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 10, 1992.]

COLUMBIA: FUEL CELLS TESTED

Tests of the Space Shuttle Columbia's fuel cells have been completed in OPF Bay 1. Work in progress: removing the main engines and transferring them to the VAB engine shop; preparations to install the remote manipulator system; tests of the hydraulic flight control system; functional tests of the external tank doors; leak and functional tests of the auxiliary power units; inspections of the radiators; replacement of a water spray boiler; reconfiguration of the payload bay. Discovery, undergoing processing activities in OPF Bay 2, will be transferred to VAB high bay 2 to make room for Atlantis which returned from space yesterday. Discovery will remain in the VAB until Endeavour is transferred from OPF Bay 3 to the VAB later this month. Technicians, meanwhile, are gaining access to the wings to perform structural modifications. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 10, 1992.]

August 11: **STS 47 PROCESSING ACTIVITIES**

Technicians in OPF Bay 3 are stowing Endeavour's Ku-band antenna. Other work in progress includes: final inspections of the payload bay; closing the payload bay doors; installation of sleep stations; closeouts of the vehicle; preparations to install the doors on the aft compartment. Work scheduled: structural leak checks of the Orbiter this week; weight and center of gravity determinations; rollover to the Vehicle Assembly Building targeted for August 17 for mating with the external tank and solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 11, 1992.]

STS 46: POST-FLIGHT WORK ON ATLANTIS

With the return of Atlantis to the Kennedy Space Center on August 8, technicians in Orbiter Processing Facility Bay 2 have begun opening the payload bay doors; installing protective covers over payload items and preparing to remove the chin panel for inspections. Work scheduled: removal of the IMAX camera August 12 and the Tethered Satellite and EURECA hardware tomorrow also. [Brown, FLORIDA TODAY, Aug. 10, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 11, 1992; Halvorson, FLORIDA TODAY, Aug. 11, 1992.]

COLUMBIA/DISCOVERY PROCESSING

Technicians in OPF Bay 1 have removed Columbia's main engines and transferred them to the VAB engine shop and pressurized the main landing gear struts. Work in progress: installation of the wheels and tires; preparations to install the remote manipulator system; functional tests of the external tank doors; leak and functional tests of the auxiliary power units; inspections of the radiators; replacement of a water spray boiler and reconfiguring the payload bay. Discovery continues to undergo processing activities while in OPF Bay: gaining access to the wings to perform structural modifications and jacking and leveling the Orbiter. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 11, 1992.]

MAHONEY NAMED TO TSS INVESTIGATION

William G. Mahoney, KSC Payload Operations, has been named along with six others to a committee formed to investigate the problems that occurred during the first mission of the Tethered Satellite System (TSS) during STS 46. **Darrell Branscome,** Chief Engineer at Langley Research Center, will chair the committee. The board was appointed by **Jeremiah W. Pearson, III,** Associate Administrator, Office of Space Flight, NASA Headquarters. "The board is authorized to take all necessary action to review the anomalies associated with the TSS problems to determine the possible cause and recommend corrective measures to prevent reoccurrence," according to Pearson. An initial report of the review findings, supporting data and analysis are to be submitted to Pearson by August 28, 1992.

All relevant flight hardware and data that team members will need to examine are being maintained in the "as flown" condition. Tethered Satellite System hardware removed from Atlantis following its landing is being kept in a secure location at Kennedy Space Center. Data obtained during the mission, as well as pertinent data gathered during development and testing phases of the Tethered Satellite Program, is being preserved with no alteration. The Board of Investigation is supported by the TSS Systems Working Group based at the Marshall Space Flight Center (Huntsville, AL), and by other MSFC elements the board may require. (NASA/KSC News Release No. 92-129, Aug. 11, 1992; Banke, FLORIDA TODAY, p. 6A, Aug. 14, 1992.]

DELTA FLIGHT DELAYED AT CCAFS

A faulty command receiver aboard a Delta 2 rocket at Cape Canaveral Air Force Station resulted in the delay of the rocket's Satcom C-4 mission. The unit was removed and sent to its manufacturer, GE Astro Space (Princeton, NJ) for repairs, according to GE spokeswoman Laura

Eberle. "A new launch date has not been decided on as yet, but we're looking somewhere during the week of August 24," she said. ["Satellite Ready for Delta Launch," FLORIDA TODAY, p. 10E, Aug. 9, 1992; Banke, FLORIDA TODAY, p. 5A, Aug. 12, 1992.]

August 12: **ENDEAVOUR: PAYLOAD BAY DOORS CLOSED**

The Space Shuttle Endeavour, currently in OPF Bay 3, now has closed payload bay doors. Work in progress: structural leak checks of the vehicle; fitting the external tank door thermal barriers; installation of sleep stations; closeouts of the vehicle; preparations to install the doors on the aft compartment. Weight and gravity determinations must be done before rollover to the Vehicle Assembly Building on August 17. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 12, 1992.]

COLUMBIA: TESTS UNDERWAY

Columbia is undergoing processing activities in preparation for its STS 52 LAGEOS mission. Work in progress on Columbia in OPF Bay 1 includes: installing a getaway special beam in the payload bay; functional tests of the orbital maneuvering system pod; installing main landing gear wheels and tires; functional tests of the external tank doors; leak and functional tests of the auxiliary power units; inspections of the radiators and replacement of a water spray boiler. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 12, 1992.]

DISCOVERY AND ATLANTIS OPERATIONS

Technicians are gaining access to Discovery's wings to perform structural modifications and plan to transfer the Space Shuttle to OPF Bay 3 after Endeavour is rolled to the VAB next week. Atlantis is undergoing post-flight operations in OPF Bay w. Workers are removing the Tethered Satellite and EURECA payload hardware beginning at 1 p.m. today; preparing to remove the chin panel for inspections and conducting post-flight inspections. The IMAX camera is scheduled for removal from Atlantis. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 12, 1992.]

TITAN 4 SENT TO PAD TO REPLACE CORRODED ROCKET

A classified national security satellite will be launched before the end of the year aboard a Titan 4 rocket which has just been rolled to the launch pad. Another Titan had been on the pad for over a year, but rust damage caused officials to worry that the rocket would explode in flight. [Halvorson, FLORIDA TODAY, p. 6A, Aug. 13, 1992.]

August 14: **SNYDER RECEIVES JAPANESE FLAGS**

A quartet of Japanese students visited the Kennedy Space Center today and presented KSC with a set of streamer-like flags shaped like carp fish. The gifts were received by **Glenn Snyder**, STS 47 Payload Processing Manager; Endeavour will carry a joint American/Japanese payload. Two of Japan's highly prized ornamental fish will fly aboard the STS 47 mission as experiments inside the Spacelab-Japan (SL-J) module, which will remain in Endeavour's payload bay during the week-long Shuttle flight. Japanese scientists developed the life science experiment to study the effects of weightlessness may have on the behavioral and neurophysiological functions of the fish. The student group consists of two boys and two girls and ranges from 10 to 15 years of age. The four were chosen from a field of 613 students who submitted entries to an essay contest

sponsored by the Nagoya Broadcasting Network of Japan. The contest was also endorsed by the Japanese Board of Education, the National Space Development Agency of Japan (NASDA) and the Japan International Space Year Association. In commemoration of the upcoming Shuttle mission, "The Dream Toward Space" was chosen as the theme of the contest. Presentation of the flags occurred at Spaceport USA's Rocket Garden August 14 at 10 a.m. [NASA/KSC News Release No. 108-92, Aug. 10, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 10, 1992.]

ENDEAVOUR: VEHICLE CLOSEOUTS UNDERWAY

Workers in OPF Bay 3 are closing out Endeavour in preparation for its STS 47 mission. Other work in progress: a final cycle of the payload bay doors; installation of a seal for the airlock hatch; structural leak checks of the wings and preparations for installing the doors on the aft compartment. Weight and gravity determinations were set to be conducted on August 16; rollover to the Vehicle Assembly Building remained set for August 17. In the VAB, Endeavour will be mated with its external tank and solid rocket boosters, pending resolution of the crane incident in the VAB. [Banke, FLORIDA TODAY, Aug. 13, 1992; KSC SHUTTLE STATUS REPORT, 11:30 a.m., Aug. 14, 1992; Banke, FLORIDA TODAY, Aug. 16, 1992; "Crane Problem May Delay Start of Endeavour's Trip," THE ORLANDO SENTINEL, Aug. 18, 1992.]

COLUMBIA/DISCOVERY PREPPING FOR MISSIONS

In OPF Bay 1, technicians are testing Columbia's brake system. They are also conducting leak and functional tests of the main propulsion system liquid oxygen system; functional tests of the orbital maneuvering system pod; reconfiguration of the aft flight deck and tile operations. Discovery, which remains in VAB Bay 2, continues to undergo structural modifications inside its wings. The vehicle will be transferred to OPF Bay 2 once Endeavour has been rolled to the VAB next week. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., Aug. 14, 1992; "Orbiter Update," FLORIDA TODAY, p. 10E, Aug. 16, 1992.]

ATLANTIS: MODIFICATION PERIOD

Atlantis is currently in OPF Bay 2 following its recent landing at Kennedy Space Center at the conclusion of its STS 46 mission. In the OPF, technicians have offloaded residual hypergolic propellant. Work in progress: post-flight inspections; removing the vehicle's tires; tests of the hydraulic system; preparations to remove the forward reaction control system; post-flight inspections of the main engines. Scheduled: removal of the Tethered Satellite, EURECA and EOIM payload hardware. [KSC SHUTTLE STATUS REPORT, 11:30 a.m., Aug. 14, 1992; "Orbiter Update," FLORIDA TODAY, p. 10E, Aug. 16, 1992.]

August 16: ENDEAVOUR/HUBBLE RESCUE MISSION

Hubble Telescope scientists have gotten their wish; NASA has agreed to schedule an Endeavour flight for the rescue of the HST which has a flawed mirror. "We were hoping for Endeavour, and we're very pleased," said **Ed Weiler**, Hubble's Chief Scientist. Repairing the HST will take three spacewalks, but Hubble managers wanted an Orbiter with the capability of four EVAs. Weiler said, "It gives us a whole 'nother day of contingency on top of our three days. If we learned anything from Intelsat, it is try to have as much contingency time to think as you can." [Banke, FLORIDA TODAY, pp. 9E & 10E, Aug. 16, 1992.]

August 17: CRANE ACCIDENT TO BE INVESTIGATED

Center Director **Robert L. Crippen** has appointed an investigation board to examine an incident involving a 250-ton crane that apparently experienced erratic movement while lifting a solid rocket booster segment in High Bay 1 of the Vehicle Assembly Building (VAB). ON August 11, crane operators were preparing to stack the left forward segment for the STS 52 mission using the crane's slow speed operating mode. There was a sudden increase in the lateral speed of the crane during the operation. The operator stopped the crane immediately and there was no damage to personnel, flight hardware or ground equipment. **Russell Lloyd** (Chief, Facilities Division, Space Shuttle Office) said, "We were never in a close enough position of creating a catastrophe." Columbia is scheduled to fly the STS 52 mission, targeted for launch in October, with the Laser Geodynamic Satellite-2 (LAGEOS II) payload.

A team is troubleshooting the crane and will make necessary repairs prior to using it again. Booster stacking operations and all crane operations have been suspended pending the resolution of the issue. The 30-foot-long, 12-foot-diameter, left forward booster segment has been transferred to a storage facility while the investigation is continuing. **Jackie E. Smith** (Director, Safety and Reliability) has been named to chair the board. Assisting Smith on the investigation are board members: **David Kelley** (Chief, Structural Systems Branch, Ground Engineering); **Howard Meeks** (Systems Engineering Section, Payload Operations Directorate; **Ronald Eatman** (Project Engineering Staff, Facilities Engineering Directorate); **James Myers** (Systems Assurance Office, Mission Assurance Directorate); **Arthur Clark** (Cables and Special Power Section, Facilities Engineering Directorate; **Todd Steinrock** (Mechanical Section, Facilities Directorate). **Malcolm Glenn** will serve as the safety advisor, **John Biedenham** will provide legal assistance and **Lisa Malone** is the public affairs representative. Broad functions include investigating the facts surrounding the mishap, determining the probable cause, assessing the possibility of a recurrence or similar mishap, and recommending corrective action. A final report is due during the second week of October. [Banke, FLORIDA TODAY, p. 6A, Aug. 12, 1992; Banke, FLORIDA TODAY, p. 6A, Aug. 13, 1992; NASA/KSC News Release No. 109-92, Aug. 17, 1992; Banke, FLORIDA TODAY, p. 6A, Aug. 14, 1992; Banke, FLORIDA TODAY, p. 2A, Aug. 16, 1992; Banke, FLORIDA TODAY, pp. 1A-2A, Aug. 17, 1992.]

SPACE PROJECT MAY MOVE TO BREVARD

A Goddard Space Flight Center project may be moved from Maryland to Brevard County soon. "There would be a big advantage in not having to move people up and down the East Coast all the time," said **Donald Williams**, manager of the ozone-monitoring experiment which is carried on the Shuttle once a year. The project's managers hope to lease a building on U. S. 1 owned by Technological Research and Development Authority. TRDA Executive Director **Frank Kinney** said, "I'm hoping for a partnership, not just a landlord-tenant relationship." Other possible ventures include: a technology transfer agreement with Goddard for commercial applications of space technology and cooperative work agreements and research opportunities for Florida university students. The decision on the possible move is to be made public in September. [Brown, FLORIDA TODAY, p. 1A, Aug. 18, 1992.]

WEATHER MAY DELAY ATLAS LAUNCH

An Atlas rocket is nearly ready for launch from Cape Canaveral Air Force Station this week, but stormy Florida weather may keep the rocket on the ground. "Thunderstorms in the area are the main concern," said **Terri Bracher**, spokeswoman of the 45th Space Wing, headquartered at Patrick Air Force Base, FL. General Dynamics spokeswoman **Julie Andrews** said, "Everything is going just fine and the vehicle looks good. We're just watching the weather." The Atlas will carry the Galaxy 1-R payload, a Hughes Aircraft Co. communications satellite. Launch is set for August 20 and windows extend from 6:39 to 7:54 p.m., 8:26 to 8:39 p.m. and 9:10 to 10:20 p.m. [Banke, FLORIDA TODAY, p. 6A, Aug. 18, 1992.]

ENDEAVOUR AWAITS RESOLUTION OF CRANE PROBLEM

Endeavour was moved to the Vehicle Assembly Building early August 17, but KSC managers continue to debate the safety of the VAB's giant lifting cranes. "We still don't know exactly why the crane behaved the way it did," said **Lisa Malone**, KSC spokeswoman. All suspect parts are being tested in a KSC laboratory and have been replaced with spares. Test results will effect Endeavour's launch date which is currently targeted for September 11; the liftoff will be delayed if Endeavour cannot be lifted for mating with its external tank and solid rocket boosters in the next several days. Discovery was moved on the 17th from the VAB to OPF Bay 3 just vacated by Endeavour and continues to undergo modifications and maintenance like that of Columbia last year. [Banke, FLORIDA TODAY, p. 6A, Aug. 18, 1992; "Orbiter Update," FLORIDA TODAY, p. 10E, Aug. 16, 1992.]

August 18:

CRANE USE APPROVED

Endeavour will be lifted into place for mating with its external tank tomorrow because Kennedy Space Center management has approved the use of a suspect crane. KSC spokeswoman **Lisa Malone** said that tests show the crane to be functional but that additional caution will be used. Another crane, the one which proved faulty last week, will continue to undergo tests and analysis. Endeavour should be connected to its ET by 8 p.m. tomorrow and rolled to LC 39B early Tuesday morning, about three days later than planned. [Banke, FLORIDA TODAY, p. 6A, Aug. 19, 1992.]

UPPER STAGE PROBLEM FOR MO

The Mars Observer probe is having a problem with its upper stage. Last weekend, when a worker tried to apply a material to the upper stage a spark passed between his tool and the upper stage motor, according to **Laura Ayers**, spokeswoman for Orbital Sciences Corp. Officials say they are working around the clock to determine the source of the stray voltage and fix it. Pending the problem's resolution, the Mars Observer (MO) will be installed in its Titan nose cone and moved out to LC 40 from which the rocket will be launched. [Banke, FLORIDA TODAY, p. 6A, Aug. 19, 1992.]

August 19:

REPAIR SPARES DELAY IN MO LAUNCH

"We are on schedule for launch," said **Dave Evans**, Project Manager for the Mars Observer Mission. An electrical problem with the spacecraft's transfer orbit stage has been fixed. Tests determined that stray voltage came from a radio system which allows the motor to communicate with ground; suspect parts were replaced. Launch is again on track for

September 16. **Wesley Huntress**, Director of Solar System Exploration for NASA, said, "After 17 long years, America is going back to Mars." [Banke, FLORIDA TODAY, p. 1A, Aug. 20, 1992.]

COSMONAUTS TOUR SPACE CENTER

Two cosmonauts and their families toured the Kennedy Space Center today. The cosmonauts, **Anatoly Artsebarsky** and **Sergei Krikalev**, expressed an interest in flying aboard the Space Shuttle. The pair toured Launch Complex 39B this afternoon. Krikalev was aboard the space station Mir when the Soviet Union collapsed. ["Soviet Astronauts," FLORIDA TODAY, p. 6A, Aug. 19, 1992.]

August 21:

ENDEAVOUR HARDMATED TO ET

In the Vehicle Assembly Building High Bay 3, Endeavour was hardmated to its external tank this morning at 5:30 EDT. Work in progress for STS 47: making electrical connections between the vehicle elements; connecting the T zero umbilicals to the vehicle. Work scheduled: Shuttle Interface Test to verify connections between the elements and the launch platform set to begin tomorrow night; rollout to Launch Complex 39B is targeted for midnight August 24; the Terminal Countdown Demonstration Test (TCDT) is set for August 27 & 28. Launch is planned for the second week of September. [KSC SHUTTLE STATUS REPORT, 8 a.m., Aug. 21, 1992.]

COLUMBIA: PARTS REPLACED

During processing activities in OPF Bay 1, Columbia has had its No. 1 APU and No. fuel cell replaced. Technicians have installed the vehicle's drag chute and conducted leak and functional tests of the water spray boiler. Work in progress: installation of the main engines; functional tests of the orbital maneuvering system pod; tile operations; testing of connections for the STS 52 payload. Discovery, now in OPF Bay 3, is undergoing power up tests; hydraulic system operations; structural modifications of its wings and preparations for powering up the vehicle. An OMS pod is scheduled for installation this weekend. [KSC SHUTTLE STATUS REPORT, 8 a.m., Aug. 21, 1992.]

ATLANTIS: MODIFICATION PERIOD BEGINS

Atlantis, just returned from its STS 46 mission, has now entered a modification period at Kennedy Space Center prior to being ferried to Palmdale, CA, for lengthy modifications at Rockwell International's plant. Work in progress: removing components in preparation for the ferry flight and preparations to offload the auxiliary power unit catch bottles and to drain residuals from the Orbiter. Work scheduled: draining the auxiliary power unit catch bottles. During this activity both OPF Bays 1 and 2 will be locked out this weekend. [KSC SHUTTLE STATUS REPORT, 8 a.m., Aug. 21, 1992; "Bye-Bye Birdie: KSC Team Prepares for Atlantis Send-Off," FLORIDA TODAY, pp. 10E & 9E, Aug. 23, 1992.]

RAIN GROUNDS ATLAS

General Dynamics Corp. scrubbed its second attempt to launch its Atlas rocket due to rainy weather in the launch area. The Atlas will carry a Hughes Aircraft communications satellite to a geosynchronous orbit. A previous attempt to launch was also scrubbed because of weather. [Halvorson, FLORIDA TODAY, Aug. 22, 1992.]

MARS OBSERVER MOVED TO LC 40

The Mars Observer spacecraft passed another milestone toward launch when it was moved from the Payload Hazardous Servicing Facility on Kennedy Space Center to Launch Complex 40 on Cape Canaveral Air Force Station and mated to the Martin Marietta Titan III rocket. With the payload atop the launch vehicle, checks of the Mars Observer spacecraft and the attached Transfer Orbit Stage (TOS) will begin this weekend. Two major exercises to prepare for launch are planned next week: an Operational Readiness Test and a Countdown Demonstration Test. The ORT - scheduled for August 26 - will test all facilities that send and receive data during flight activities. These facilities include NASA, JPL, and Air Force tracking and data systems around the world. The countdown dress rehearsal - on August 28 - will simulate launch day activities and all countdown events as closely as possible. The mobile service tower will be retracted from around the launch vehicle, and the full NASA, Martin Marietta and Orbital Sciences launch team will participate in this exercise. All activities are currently on schedule to support a launch at the opening of the Mars planetary opportunity on September 16, with the window extending from 1:02 to 3:05 p.m. EDT. [NASA/KSC News Release No. 111-92, Aug. 21, 1992.]

ENDEAVOUR'S ROLLOUT

Endeavour is scheduled to rollout to Launch Complex 39B beginning at 12:01 a.m. EDT, August 25. Moving at top speed of 1 mph, the crawler transporter will transfer the STS 47 vehicle elements 4.1 miles in about seven hours. On August 17, NASA's newest Space Shuttle was towed to the Vehicle Assembly Building after its 11-week processing period in the Orbiter Processing Facility. In the VAB, Endeavour was mated to its external tank and solid rocket boosters today and tests of critical connections between the vehicle elements and the launch platform were scheduled for this weekend. Flight crew members for Mission STS 47 are scheduled to arrive next Wednesday for the TCDT. The practice countdown will begin at 8 a.m., August 27, at the T-24 hour mark leading up to the simulated T minus zero mark at 11 a.m. on August 28.

Commanding the STS 47 mission is **Robert L. "Hoot" Gibson** and **Curtis L. Brown, Jr.** is the Pilot. The four mission specialists are **Mark C. Lee, N. Jan Davis, Jay Apt** and **Mae C. Jemison. Mamoru Mohri** from the Japanese Space Agency, NASDA, is the payload specialist. While at Kennedy Space Center, the crew will receive training in emergency escape procedures at the launch pad, practice driving the M113 tracked vehicles and practice flying in the Shuttle Training Aircraft. In addition, the four mission specialists and Payload Specialist Mohri will visit Hangar L on Cape Canaveral Air Force Station to meet with several Spacelab J principal investigators. Spacelab J is the primary mission of STS 47; it was installed in Endeavour on July 14. Flight crew members conducted a thorough walkdown of the habitable module shortly after its installation. Endeavour's end-of-mission landing is planned at Kennedy Space Center's Shuttle Landing Facility. KSC's landing and recovery teams will be on hand to prepare the vehicle for the tow back to the OPF. STS 47 will be Endeavour's second space mission. It will be a planned seven-day around-the-clock science gathering mission and it set for the second week of September. [NASA/KSC News Release No. 112-92, Aug. 21, 1992.]

August 22: SPACEPORT FLORIDA LAUNCH SET FOR TODAY

Spaceport Florida hopes that today's launch of a suborbital weather probe today will give the state agency a boost as well. "We certainly would have been better off launching this

a year ago," said **Edward Ellegood**, Spaceport spokesman. ["Spaceport Hopes Launch Today Will Lift Sagging Program," FLORIDA TODAY, p. 8B & 7B, Aug. 22, 1992; Brown, FLORIDA TODAY, p. 7A, Aug. 22, 1992.]

KSC/CCAFS PREPARE FOR ANDREW

Workers at Kennedy Space Center and Cape Canaveral Air Force Station worked today to prepare for a possible onslaught by Hurricane Andrew. The rockets and satellites at risk are valued at nearly $1 billion. Endeavour's launch date may be pushed back to September 12. KSC spokeswoman **Lisa Malone** said, "We're working with a tight schedule now, and if we had to stay in the VAB we would probably have to re-evaluate the launch date." Air Force Sgt. **J. P. Butler** said, "We are preparing for sustained winds of up to 50 mph within the next 72 hours." KSC spokesman **George Diller** said, "Right now our inclination is to ride out the storm." He said the Mars Observer could be pulled off the Titan 3 rocket if necessary and taken to a nearby shelter; such a move would likely delay the launch. [Halvorson, FLORIDA TODAY, p. 4A, Aug. 23, 1992.]

ROBOTS TO CLEAN AT KSC

"We're looking at more structured and controlled methods of doing processing - including cleaning the facilities," said **Gabor Tamasi** of KSC's Robotics Automation Development Laboratory. The robots are not designed to replace human janitors, but are built to work on overnight cleaning stints. "The robot can do the job around the clock," said Tamasi, who saw such a robot at a trade show last year. "It looked like a large square object, about 30 inches long, 20 inches high and 24 inches wide. It had scrubbers in the front and a squeegee behind the scrubbers. It dispensed cleaning solution, then had a vacuum to suction it up. It cleaned really well." The robot will be tested in buildings which are not critical to processing operations and contract proposals will be accepted at Kennedy Space Center until August 27. [Brown, FLORIDA TODAY, p. 10E, Aug. 23, 1992.]

ENDEAVOUR TESTS SCHEDULED FOR TODAY

In the Vehicle Assembly Building workers are preparing a key test to verify electrical connections between the vehicle elements and the crawler and whether the elements are properly attached to each other. If the work is completed on schedule, rollout will occur August 25. [Brown, FLORIDA TODAY, p. 7A, Aug. 22, 1992.]

ATLAS DESTROYED AFTER LAUNCH

An Atlas rocket launched today was destroyed about eight minutes into its flight because it had careened out of control when its upper stage failed to ignite. An investigative board was immediately formed by General Dynamics, manufacturer of the Atlas. Stormy weather had delayed the launch Dynamics which came on its third attempt. The rocket carried a Hughes Aircraft Co. communications satellite. Lightning forced the first scrub of the launch on Aug. 20. Today's launch windows were from 6:40 to 7:55 p.m.; 8:27 to 8:39 p.m. and 9:11 to 10:20 p.m. Today's attempt was the fifth commercial launch by General Dynamics which has commitments for 25 commercial launches throughout the decade. [Brown, FLORIDA TODAY, p. 1A, Aug. 20, 1992; "Atlas Rocket, Satellite Explode Over Atlantic," FLORIDA TODAY, Aug. 23, 1992; Halvorson, FLORIDA TODAY, p. 1A, Aug. 23, 1992; Halvorson, FLORIDA TODAY, p. 7A, Aug. 22, 1992; Halvorson, FLORIDA TODAY, p. 2A, Aug. 23, 1992.]

SPACEPORT FLORIDA LAUNCHES FIRST ROCKET

Spaceport Florida launched a ten-foot Microstar rocket from a pad at Cape San Blas at 10 a.m. this morning. The first rocket ever launched by a state agency had been delayed 30 minutes by clouds in the area. "I'm not the type that jumps up and down, but inside I certainly was," said **Ed O'Connor**, Executive Director of the Spaceport Florida Authority. The Microstar's mission was to gather "basic weather data over the launch site about 20 miles west of Apalachicola, FL. Ozone-measuring launches are expected to take place starting in the fall, according to **Kevin Kloesel**, assistant professor of meteorology at Florida State University. ["1st State Rocket Soars," FLORIDA TODAY, pp. 14B & 13B, Aug. 23, 1992; Yeomans, THE ORLANDO SENTINEL, Aug. 23, 1992.]

FIVE SILVER SNOOPYS AWARDED

Silver Snoopy Awards were recently awarded to three Lockheed employees and two NASA employees. Astronaut **James H. Newman** presented the Snoopy to Lockheed's **Christina Pechon, James Eshleman** and **David Baumann**. NASA employee **Andrew Haugevik** received his Snoopy from astronaut **Thomas D. Akers** and **Ellen Dozier**, also a NASA employee, received her Snoopy from astronaut **Mark C. Lee**. Recipients are given a Silver Snoopy pin which has been flown on a previous Shuttle mission plus a framed certificate and a congratulatory letter signed by the presenting astronaut. ["Five Get Astronauts' Silver Snoopy Awards," FLORIDA TODAY, p. 9E, Aug. 23, 1992.]

August 23:

ENDEAVOUR: ROLLOUT MAY BE DELAYED

Hurricane Andrew may delay the rollout of Endeavour to Launch Complex 39B tomorrow morning; the trek was originally scheduled to begin at 4:00 a.m. August 24. If winds are greater than 46 miles per hour, rollout will not occur. Bus tours from Spaceport USA were suspended while hurricane preparations were underway. KSC spokesman **Mitch Varnes** said, "We didn't want the extra traffic when we're moving stuff around." Extra sandbags have been placed around doorways to prevent water from seeping in; loose equipment has been moved into the VAB and OPFs. The Mars Observer spacecraft will wait out the storm at its launch pad, LC 40. [Brown, FLORIDA TODAY, p. 6A, Aug. 24, 1992.]

ATLAS INVESTIGATION MOVES TO CALIFORNIA

Hurricane Andrew's imminent arrival has forced General Dynamics to move its investigation of Saturday's Atlas rocket failure to California. "We had planned to leave Florida on Monday, but the hotel really is encouraging us to leave now," said company spokeswoman **Julie Andrews**. When one of the Atlas's second stage engines failed to start after liftoff August 22, the rocket was destroyed by range safety officers. The payload had been a Hughes Aircraft Co. communications satellite. ["Atlas Prove Moves to California," FLORIDA TODAY, p. 2A, Aug. 24, 1992; Date, THE ORLANDO SENTINEL, Sept. 23, 1992.]

August 24:

I-NET WINS KSC CONTRACT

NASA's John F. Kennedy Space Center has selected I-Net, Inc. (Bethesda, MD) for negotiation of a contract to provide engineering support services to the center's Engineering Development Directorate. It is the largest contract KSC has given to a minority-owned firm and is the largest contract ever won by the company. **David Wells**, Vice President and Corporate Counsel, said, "We're delighted minority companies are

getting this interest from the government." I-Net, Inc. replaces Boeing, Inc. The contract will run for five years starting October 1, 1992, and is valued at more than $100 million. I-Net will provide a broad base of engineering services which may range in scope from technical manpower in support of a variety of government laboratories to engineering and management of complex applied research and technology projects. This includes engineering studies and investigations; conceptual, preliminary, detail and development engineering; and documentation support and maintenance. The contract was competed nationally as a small, disadvantaged business set-aside. [NASA/KSC News Release No. C92-12, Aug. 24, 1992; Liden, FLORIDA TODAY, p. 18C, Aug. 25, 1992.]

ENDEAVOUR: ELECTRICAL CONNECTIONS MADE

In the Vehicle Assembly Building, the Shuttle Interface Test has verified the connections between the vehicle elements and the launch platform; all electrical connections have been completed. Work in progress: preparations to roll the vehicle out to Launch Complex 39B and pre-rollout inspections. Work scheduled: retraction of the VAB platforms later tonight; rollout to LC 39B set for 4:00 a.m. tomorrow; TCDT targeted for August 27-28; launch set for the second week in September. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 24, 1992.]

COLUMBIA: 1 & 3 ENGINES INSTALLED

In OPF Bay 1, Columbia has had its No. 1 and 3 engines installed in addition to the installation of a power reactant storage and distribution system tank. Work in progress: installation of the No. 2 main engine; preparations to install the remote manipulating system (also called the "robot arm"); tile operations and testing of connections for the STS 52 payload. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 24, 1992.]

DISCOVERY/ATLANTIS PROCESSING

Discovery's left orbital maneuvering system pod was installed this weekend. Work in progress in OPF Bay 3: connections of the left OMS pod; integrated testing of the main propulsion system; tests of the Microwave Scanning Beam Landing System. The auxiliary power unit catch bottles of Atlantis have been drained while the Orbiter remains in OPF Bay 2. Work in progress prior to the ferry flight to Palmdale, CA: removing components and the auxiliary power unit number 2. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 24, 1992.]

ENDEAVOUR ROLLS OUT TO LC 39B

First motion of the Space Shuttle Endeavour came at 3:25 a.m. as workers rolled the Orbiter out to Launch Complex 39B and was hard down at the pad at 10:15 a.m. Rollout was delayed a bit by the space center's efforts to batten down in advance of the arrival of Hurricane Andrew. The KSC Launch Readiness Review is underway today. Work scheduled: making connections between the launch pad facilities and the vehicle elements; STS 47 flight crew arrival is expected at 11:30 a.m. tomorrow; the Terminal Countdown Demonstration Test begins at 8 a.m. August 27 and ends with the simulated T zero at 11 a.m. Friday, August 28. Launch remains targeted for the second week of September. [Brown, FLORIDA TODAY, p. 2A, Aug. 25, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 25, 1992; Grinter, Press Site Librarian.]

COLUMBIA: NO. 2 ENGINE INSTALLED

Workers in Orbiter Processing Facility Bay 2 have completed the installation of Columbia's number 2 main engine in preparation for the STS 52 mission. Work in progress: tests of the fuel cells; functional tests of the orbital maneuvering system pods; hookups of the three main engines; preparations to install the remote manipulator system; tile operations; testing of the connections for the STS 52 payload. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 25, 1992.]

MODIFICATIONS: DISCOVERY & ATLANTIS

While Discovery remains in OPF Bay 3, a number of processing activities are taking place: preparations to service freon coolant loop no. 2; tests of the left orbital maneuvering system pod; integrated testing of the main propulsion system. Atlantis, meanwhile, is in OPF Bay 2 and is undergoing final processing activities before being ferried to Palmdale, CA: modifications to the communications system; drying of the main engines; removing components; removal of another auxiliary power unit; preparations to remove the robot arm (RMS); flushing of the waste management system. Auxiliary power unit no. 2 has been removed. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 25, 1992.]

August 25: LAUNCH READINESS REVIEW STATEMENT

Following the conclusion of today's STS 47 Launch Readiness Review, Space Shuttle Launch Director **Robert B. Sieck** determined that the Shuttle Endeavour and Spacelab-J payload are on target for a launch on September 12. "We've mapped out an ambitious but makeable schedule for the STS 47 launch, while still allowing the team time off for the Labor Day holiday," Sieck said. "We're going to continue readying Endeavour and look forward to meeting with other managers next week at the Flight Readiness Review to set a firm launch date." [STS-47 LAUNCH READINESS REVIEW STATEMENT, Aug. 25, 1992.]

FOLEY MATERIAL WINS STATION CONTRACT

Foley Material Handling Co., Inc. (Ashland, VA) has been awarded a $678,710 contract to fabricate, assemble and install overhead cranes in the Space Station Processing Facility (SSPF) and the Payload Spin Test Facility Replacement (PSTF-R) at Kennedy Space Center. The contract was awarded August 11, and the company will have until August 1993 to complete the final assembly and test of four cranes in the SSPF. This equipment includes one crane with a lifting capacity of 15 tons in the facility's airlock, two 5-ton cranes in the intermediate bay and one 5-ton crane in the hardware assembly and inspection area. The installation must be completed by this date so that the SSPF can be ready for operation in August 1994. Installation of a 20-ton crane in the high bay of PSTF-R (also known as the Hazardous Processing Facility) must be completed by November 1993. Kennedy Space Center will be responsible for the prelaunch processing of all Space Station Freedom flight hardware, as well as its launch into orbit aboard Space Shuttle Orbiters. The SSPF will serve as the primary KSC facility for the inspection, assembly and final checkout of space station components. [NASA/KSC News Release No. 113-92, Aug. 25, 1992.]

August 26: **ENDEAVOUR POWERED UP AT PAD**

The Space Shuttle Endeavour was hard down on the pad at Launch Complex 39B at 10:15 a.m. yesterday and was powered up last night. At 1300 hours Tuesday, the rotating service structure was moved into position around the vehicle. The seven members of the STS 47 flight crew arrived early at KSC last night - at 9:20 p.m. - to avoid adverse weather conditions from Hurricane Andrew. Technicians at the pad are making connections between the launch pad facilities and the vehicle elements. Work scheduled: terminal countdown demonstration test begins at 8 a.m. Thursday (August 27) and ends with the simulated T-zero at 11 a.m. Friday (August 28); main engine flight readiness test and helium signature leak tests this weekend. Launch remains targeted for the second week in September. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 26, 1992; Banke, FLORIDA TODAY, Aug. 27, 1992.]

[] **COLUMBIA & DISCOVERY: PROCESSING ACTIVITIES**

In Orbiter Processing Facility Bay 1, technicians are preparing to install a robot arm (RMS) in Columbia's cargo bay as part of its STS 52 preparations. Other activities include: installation of the CANEX payload; preparations for the Crew Equipment Interface Test (CEIT); configuring the crew cabin for flight; installing window number 8. The nose landing gear tires have been installed on Discovery which is being processed in OPF Bay 3; the brakes have also been installed. Work in progress: installing the main landing gear tires; preparations to service freon coolant loop number 2; tests of the left orbital maneuvering system pod; integrated testing of the main propulsion system; preparations for the CEIT test this weekend. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 26, 1992.]

[] **ATLANTIS: MODIFICATION PERIOD IN OPF BAY 2**

The three auxiliary power units of Atlantis have been removed while the Orbiter is still in OPF Bay 2 prior to its ferry flight to California. Preparations have also been made to connect the left forward assembly/nose cone. Work in progress: post-flight measurements of the 17-inch disconnect umbilicals; deservicing of the auxiliary power unit water; modifications to the communications system and preparations to remove the remote manipulator system (also known as the robot arm). [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 26, 1992.]

[]: **ANDREW SHUTS DOWN MS/LA CENTERS**

As the Space Shuttle Endeavour was rolling to the pad yesterday, NASA centers in Mississippi and Louisiana were shutting down in anticipation of the arrival of Hurricane Andrew. Stennis Space Center (Bay St. Louis, MS) and Michoud Assembly Facility (New Orleans, LA) sent home almost 8,000 workers as the centers were closed to all but essential personnel, according to NASA's spokesman Don Amatore. Both sites were said to be well able to withstand the winds of Andrew. [Banke, FLORIDA TODAY, p. 1B, Aug. 26, 1992.]

August 27: **ENDEAVOUR: VEHICLE/PAD CONNECTIONS MADE**

Endeavour is now on the pad at LC 39B and technicians have completed connections between the vehicle and the pad in preparation for the Orbiter's STS 47 mission the second week in September. Work in progress: terminal countdown demonstration test

began at 0800 today; circulating the hydraulic fluid; preparations to load the hypergolic propellants into the Orbiter's onboard storage tanks. STS 47 flight crew activities: Commander **Robert L. "Hoot" Gibson** and Pilot **Curtis L. Brown, Jr.** practiced flying in the Shuttle Training Aircraft this morning while the rest of the crew visited principal investigators for Spacelab J at Hangar L. This morning, KSC Shuttle and payload team members will update the crew on the status of the vehicle and payloads. Later today, the crew will receive routine emergency escape training procedures at the launch pad. Work scheduled: terminal countdown demonstration test concludes with the simulated T zero at 11 a.m. tomorrow (August 28); main engine flight readiness test and helium signature leak tests this weekend; flight readiness review set for September 1; launch targeted for September 12. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 27, 1992; Banke, FLORIDA TODAY, p. 2A, Aug. 28, 1992.]

COLUMBIA: CANEX PAYLOAD INSTALLED

In Orbiter Processing Bay 1 technicians have installed the CANEX payload in the cargo bay of Columbia as part of the STS 52 processing activities. Other work in progress: preparations to install the robot arm (RMS); preparations for the crew equipment interface test (CEIT); configuring the crew cabin for flight; installing window number 8. [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 27, 1992.]

DISCOVERY/ATLANTIS PROCESSING/MODIFICATIONS

Discovery is in OPF Bay 3 where it is undergoing the following activities: installation of heat shields around the main engines; outfitting the crew module for flight; preparations to service freon coolant loop number 2; tests of the left orbital maneuvering system pod; integrated testing of the main propulsion system; preparation for the CEIT test this weekend. Post-flight measurements of the 17-inch disconnect umbilicals of Atlantis have been completed in OPF Bay 2 where the Orbiter is awaiting its ferry flight to Palmdale, CA, for further modifications. Other processing activities: preparations to remove the forward reaction control system (FRCS) and the three main engines; deservicing of the auxiliary power unit water; modifications to the communications system; preparations to remove the robot arm (RMS). [KSC SHUTTLE STATUS REPORT, 10 a.m., Aug. 27, 1992.]

MARS OBSERVER TO BE RESCHEDULED

The launch of Mars Observer aboard a Titan III rocket from Launch Complex 40 at Cape Canaveral is being postponed. During an inspection of the payload contained within the Titan nose fairing atop the rocket, particulate contamination was observed on the surface of the Mars Observer spacecraft. A precautionary decision has been made to remove the payload from the Titan and return it to a spacecraft facility on KSC for cleaning. The contamination may have been introduced into the fairing when a dry nitrogen purge was placed on the spacecraft as part of securing for Hurricane Andrew. KSC spokesman **George Diller** said that photographs would be taken to document the satellite's condition. "We would expect by early Monday [August 31] morning we should be able to start doing inspections," he said. Diller said that it was too early to be talking about a new launch date. The countdown dress rehearsal scheduled for August 28 will not be held at this time. A new launch date cannot be determined until it is known how long it will take to clean the spacecraft. However, a launch before the end of September is expected. The planetary launch window extends through October 13. [NASA/KSC News Release No. 116-92, Aug. 27, 1992; Banke, FLORIDA TODAY, pp. 1A-2A, Aug. 28, 1992; Banke,

FLORIDA TODAY, p. 2A, Aug. 30, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-4, Aug. 28, 1992.]

NINTH LAUNCH MOVED TO JANUARY

Endeavour's communications satellite mission originally scheduled for December of this year has been moved to the target date of January 13 of next year. A mid-December launch would have been extra expensive due to overtime and holidays. Changing the launch date, said **Jay Honeycutt**, "probably takes a little stress out of our lives." Honeycutt is Director of Shuttle Operations at KSC. Endeavour's next flight was to have been late April 1993. Making the change, "doesn't really impact anything after [January]," said Honeycutt. [Date, THE ORLANDO SENTINEL, Aug. 28, 1992.]

August 28:

KSC JOINS HURRICANE RELIEF EFFORT

A convoy of 12 trucks and cars packed with durable goods left Kennedy Space Center this morning en route to South Florida to assist residents hit hardest by Hurricane Andrew. The hurricane swept through areas of Miami earlier this week with relentless devastation, leaving more than 250,000 people homeless. Because of the great outcry for assistance, NASA and its KSC contractors began mobilizing to do whatever possible to assist those left hungry, hurting and homeless. Three 5,000-gallon water tankers led the convoy on the five-hour drive followed by two 40-foot tractor trailers loaded with an assortment of relief items for the people of South Florida. Included on the trucks are: meal packets, sleeping cots, blankets, mattresses, tents, tables, shelves, chairs, generators, plywood, rope, wire fencing, tool boxes, a three-ton hoist and a variety of clothes and shoes.

"It's all excess material over and above what we are required to keep here at the center for our own hurricane plan," said NASA's **Mike Stevens** of the Fire and Rescue Office. The convoy will establish the initial drop center for future relief efforts. **Cal Staubus**, NASA's Fire and Rescue Office Chief, said, "at this time we are piggybacking our operation with that of the Titusville Chapter of the Salvation Army. They already have a network established to dispatch the supplies." The group, made up of about 16 NASA and contractor employees, will dispatch the wares from a designated staging area to locations the Salvation Army says is in most need. Everything will be given away. Staubus said two of the water tankers have already been allocated to area hospitals. "The tanker drivers accept the possibility that their stay may be longer than expected," Staubus said. "They may be asked to continue to refill them for quite a while. We're not sure when the tankers themselves will be returned."

Forklift operator, **Ralph Brown**, EG&G Florida, Inc., said he was given an armful of toys from friends when they learned he was driving one of the convoy trucks. "It's a chance to help somebody," he said. "I even went down to Winn Dixie last night myself and bought a bunch of baby food so I could hand it out. It feels good to be able to help." Scores of other KSC employees also assisted in the effort to ready the water tankers and trucks. Included are those who loaded the supplies on the trucks and those who tested the water in the tankers to ensure its purity. Already, KSC has been organizing drop points at all major KSC facilities for the collection of additional supplies to be taken to Hurricane Andrew victims. "We will help as long as the need is present," Staubus said. [NASA/KSC News Release No. 117-92, Aug. 28, 1992.]

ENDEAVOUR FACES MAIN ENGINE TEST

Endeavour will undergo a main engine test today to confirm the operability of engine valves. Tests continue to be conducted as the launch date approaches. "We've got a full schedule between now and launch," said KSC spokeswoman **Lisa Malone**. Labor Day will provide a single day of rest for pad technicians readying Endeavour for its STS 47 mission. [Banke, FLORIDA TODAY, p. 4A, Aug. 29, 1992.]

GOLDIN: HELP SMALL BUSINESS

NASA Administrator **Daniel S. Goldin** has announced that he will upgrade the position of Small and Disadvantaged Business Director to Assistant Administrator, equal to directors of program and administrative offices. Goldin called the decision "a strong signal" in a series of moves to insure that the nation's small firms, including those owned by members of minorities and women, win a larger share of NASA contracts. He made the announcement at a small business conference in Nashua, N. H. "In the past," Goldin said, "we have focused much of our attention on working with the giant aerospace companies with the big hardware contracts and comparatively little on working with small business. We must change our orientation," he declared, stating that NASA has begun the process through a series of procurement initiatives. One of the most important changes, Goldin said, is an action to reduce drastically the amount of paperwork and other administrative tasks now required to win smaller contracts. "We are looking at 10-page requests for proposals and contracts versus 90-to-100 page documents," Goldin said.

The biggest change to help small businesses could come in mid-range procurements between $25,000 and $500,000, Goldin said. Although they represent only 15 percent of NASA's contract dollar, they account for more than 80 percent of the procurement actions. Other steps Goldin has directed the agency to take to bolster awards to small firms include:

*Requiring prime contractors to increase the percentage of subcontracts with small and disadvantaged businesses (SDBs).

*Establishing a firm percentage for SDB awards in competitive procurements instead of a mere goal.

*Making subcontracting to small firms an important evaluation factor in source selection.

*Rewarding primes that exceed their subcontracting goals.

*Establishing a "Minority Business Resource Advisory Committee" within NASA to help SDBs deal with the agency.

*Pursuing statutory authority to allow the agency to make SDB set-asides.

"NASA must take down the obstacles that discourage so many small businesses from engaging in government contracting," Goldin said. "We must make our requirements and our contracting process more accessible. We cannot bury you in forms, certifications, contract clauses and reporting requirements." Goldin stated that NASA made direct awards to small firms of $870 million in fiscal year 1991, while another $1.4 million flowed to small firms through subcontracting. "We are convinced we can do more," he declared.

NASA's Kennedy Space Center (KSC), FL, currently is evaluating proposals for a $2.7 billion base operations contract and has declared that 30 percent of this must be subcontracted to small, disadvantaged or women-owned businesses. Recently, KSC selected a minority-owned firm for a $75 million contract with options up to $150 million. "The contract is not for routine support services," Goldin noted. "It is for applied research and technology, including tasks involving telerobotics and development of a highly sensitive spectrometer to detect hazardous gas." [NASA/KSC News Release No. 92-137, Aug. 28, 1992.]

TETHERED SATELLITE INVESTIGATION

The Tethered Satellite System (TSS) Investigative Board today presented an interim status report to Space Flight Associate Administrator **Jeremiah W. Pearson, III.** Board Chairman **Darrell Branscome** reported the team is focusing on 5 problems that occurred during deployment of the Tethered Satellite System on Space Shuttle mission STS 46. Those problems are:

*Failure of the No. 2 umbilical to retract from the tethered satellite. Failure of the satellite to deploy on the first "flyaway" attempt.
*The unplanned stop of the satellite at 179 meters.
*The unplanned stop of the satellite at 256 meters.
*Inability to either deploy or retrieve the satellite at 224 meters.

The tethered satellite has been removed from the Orbiter Atlantis and placed in a checkout stand in the Operations and Control Facility at KSC. The Board had its first look at TSS hardware this week. Detailed inspection of the tether reel assembly provided evidence that the unplanned stops at 179 and 256 meters were due to a mechanical obstruction. Visual evidence and preliminary analysis point to a 1/4-inch diameter bolt which prevented part of the reel mechanism from freely traveling back and forth. The level wind mechanism, which operates similarly to the way a fishing reel feeds out line, contacted the end of the bolt preventing it from moving all the way out to its stopping point. The bolt is part of a structural modification that was installed on the reel assembly earlier this year. The modification was required following the final computer analysis which is done for every Shuttle mission to verify that all structural connections between the payload and Orbiter will withstand the rigors of launch and landing. KSC spokesman **George Diller** said, "There was some surprise to open the reel and find what caused part of the problem in such an obvious way. But this does not fully resolve the issue. There are still some things we do not understand. In fact, officials believe the bolt may have caused only two of the five observed problems.

Engineers require that attach points such as these be at least twice as strong as necessary to pass stringent safety criteria. Analysis indicated the margin of safety was less than that for some fasteners at the point where the reel assembly was mounted to its specially adapted support structure. The modification strengthened the mounting area to provide the required factor of safety. Testing of the flight hardware is planned to verify that this mechanical obstruction was the cause of the jamming of the deployment reel and the subsequent unplanned stops of the satellite at 179 and 256 meters. The Board believes that even without the problems with the umbilical and the jamming of the tether at the upper tether control mechanism, this problem would have prevented full deployment of the tethered satellite. Branscome said the board is continuing work to identify causes for the other anomalies: the umbilical problem; the first "flyaway" attempt; and the jamming at 224 meters. The next interim report is expected to be complete in

about a month. ["Tether Investigation Status Report 1, Aug. 28, 1992; Banke, FLORIDA TODAY, p. 4A, Aug. 29, 1992.]

August 29: FORECAST GOOD FOR DELTA LIFTOFF

Capt. **Mark Secrist** of the 45th Weather Squadron at Patrick Air Force Base said today that the weather was expected to be good for Monday's [September 1] launch of a Delta 2 rocket carrying a communications satellite built by G. E. Aero Space. Launch is scheduled for between 6:41 and 7:34 a.m. or 8:38 and 9:18 a.m. The launch will the 12th commercial liftoff for McDonnell Douglas Space Systems Co. and the 34th consecutive success for the Delta program since a 1986 failure. The satellite is a SATCOM 4 and will be used to provide cable programming to more than 10,000 cable systems in all 50 states. [Banke, FLORIDA TODAY, p. 2A, Aug. 30, 1992.]

COLUMBIA: LAGEOS MISSION IN OCTOBER

The Space Shuttle Columbia will launch the Laser Geodynamic Satellite in October. The STS 52 mission will study the Earth's continents and such features as California's San Andreas Fault. LAGEOS will work in tandem with a similar golf-ball sized satellite launched in 1976 on a Delta. The two satellites will be tracked by 26 ground stations which will fire lasers at the satellites and calculate the time it takes for the light to return to the ground stations. LAGEOS will be boosted to its ultimate orbit by an Italian-built upper stage motor. [Brown, FLORIDA TODAY, Aug. 30, 1992.]

August 30: ENDEAVOUR READYING FOR LAUNCH

"Everything's looking good," said KSC spokesman **Bruce Buckingham** about pre-launch preparations for Endeavour's STS 47 mission set for the second week of September. The Shuttle's propulsion system has been checked for leaks and have begun to prepare for hypergolic propellant loading onto the Orbiter's onboard fuel storage tanks. Meanwhile, weather forecasts continue to look favorable for September 1's launch of a Delta 2 with its communications satellite payload. Meteorologists predict a 90 percent chance of favorable weather for launch. ["Endeavour's Preparations Rolling Along," FLORIDA TODAY, p. 4A, Aug. 31, 1992; "Delta Set For Launch Monday," FLORIDA TODAY, p. 10E, Aug. 30, 1992.]

August 31: STS 47: ENDEAVOUR TESTING ON PAD

At Launch Complex 39B, Endeavour has had its inertial measurement unit calibrations completed. A main engine flight readiness test, helium signature test and the terminal countdown demonstration test have also been completed. The pad is being cleared for the loading of hypergolic fuels on board the Orbiter and the pad will remained closed through midnight September 1. Hypergolic fuel pressurization and the STS 47 flight readiness review have been scheduled. [KSC SHUTTLE STATUS REPORT, 12:30 p.m., Aug. 31, 1992; Halvorson, FLORIDA TODAY, Sept. 1, 1992.]

STS 52: COLUMBIA/LAGEOS MISSION

The remote manipulator system (robot arm) has been installed in the cargo bay of Columbia in preparation for its upcoming STS 52 LAGEOS mission. Payload pre-mate operations and the crew equipment interface test have also been completed. Forward reaction control system installation is underway and Columbia has been scheduled for

orbital maneuvering system functional tests. In the Vehicle Assembly Building, lift and mating of the external tank to the solid rocket boosters is scheduled to occur no earlier than September 1. [KSC SHUTTLE STATUS REPORT, 12:30 p.m., Aug. 31, 1992; Brown, FLORIDA TODAY, p. 10E, Aug. 30, 1992.]

CEIT COMPLETED FOR DISCOVERY

In Orbiter Processing Facility Bay 3, technicians have completed Discovery's crew equipment interface test. Work in progress: raising the main landing gear for tile work; crew module leak checks; deservicing freon coolant loop #1. [KSC SHUTTLE STATUS REPORT, 12:30 p.m., Aug. 31, 1992.]

ATLANTIS: MODIFICATION PERIOD CONTINUES

In OPF Bay 2, technicians have removed the forward reaction control system from Atlantis. Work in progress: the FRCS has been moved from OPF Bay 2 to the Hypergolic Maintenance Facility; main propulsion system leak checks; preparations for removing the power reactant and storage distribution system tanks. Work scheduled: removal of Atlantis' three main engines and removal of the power reactant and storage distribution system tank sets number 3 and 4. [KSC SHUTTLE STATUS REPORT, 12:30 p.m., Aug. 31, 1992.]

CABLE TV SATELLITE ORBITED

A new cable television satellite was launched into orbit today aboard a McDonnell Douglas Delta 2 launch vehicle. Liftoff came from Cape Canaveral Air Force Station's Launch Complex 17 at 6:41 a.m. Because the rocket's exhaust billowed into an unusual shape, several radio stations mistakenly reported that it had exploded. "I told them that they forgot to take gravity and the curvature of the Earth into account," said Tom Williams, a McDonnell Douglas Space Systems Co. spokesman. [Halvorson, FLORIDA TODAY, p. 2A, Sept. 1, 1992.]

SEPTEMBER

September 1: **STS 47: TCDT COMPLETED**

At Launch Complex 39B, technicians and the crew of Endeavour's STS 47 mission have completed their terminal countdown demonstration test. Inertial Measurement Unit calibrations are complete and the main engine flight readiness test and the helium signature test have also been completed. Work in progress: LC 39B has been cleared for the loading of hypergolic fuels on board the Orbiter; flight readiness review; launch countdown preparations. Work scheduled: hypergolic fuel pressurization; Orbiter aft closeouts; further troubleshooting of the 2-inch gaseous oxygen line quick disconnect valve near the main propulsion system's 17-inch liquid oxygen umbilical. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 1, 1992.]

COLUMBIA: APUS INSTALLED

Columbia has now been outfitted with its APUs in preparation for its upcoming STS 52 LAGEOS mission. Other completed tasks include: the installation of fuel cells storage tank set number 5; crew equipment interface test; payload pre-mate operations; payload bay door cycles. Work in progress: forward reaction control system electrical mates and checks; Orbiter-payload interface verification tests; ammonia boiler servicing. Work scheduled: orbital maneuvering system functional tests; auxiliary power unit hook-ups; external tank mate with solid rocket boosters (on hold pending determination of VAB 250-ton crane status). [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 1, 1992.]

DISCOVERY: STS 53 PREPARATIONS CONTINUE

In Orbiter Processing Facility Bay 3, technicians have completed crew module leak checks on Discovery and have finished the crew equipment interface test as well. The Orbiter's main landing gear have been raised for tile work. Work in progress: deservicing freon coolant loop #1 and hydraulic line fill and bleed operations. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 1, 1992.]

ATLANTIS: MODIFICATIONS CONTINUE

The forward reaction control system of Atlantis has been moved to the Hypergolic Maintenance Facility during the pre-ferry flight phase of modification of the Orbiter. Work in progress: main propulsion system leak checks; preparations for removing the power reactant and storage distribution system tank sets numbers 3 and 4; deservicing of the payload bay active cooling system and removal of the robot arm (RMS) from the vehicle's payload bay. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 1, 1992.]

STS 47: SEPTEMBER 12 IS LAUNCH DAY

NASA has targeted the launch of the Space Shuttle Endeavour on a joint U.S./Japanese mission [STS 47] on September 12, pending resolution of a technical problem with a connection in an oxygen line in the Orbiter's main propulsion system. If the problem is not resolved by the end of the week, NASA managers will reassess the launch date. Endeavour's 7-member crew will liftoff from Launch Complex 39B at Kennedy Space Center during a window that extends from 10:23 a.m. to 2:17 p.m. EDT. The 6-day, 20-hour and 37 minute mission will end with a landing on September 19 at the Kennedy Space Center.

STS 47 - also identified by its payload, Spacelab J - will be the 50th launch of the Space Shuttle Program and the second for Endeavour. Aboard the orbiting laboratory will be 43 experiments provided by Japan and the U. S. Astronaut **Robert L. "Hoot" Gibson**, making his fourth flight, will be the mission commander. The pilot is **Curtis L. Brown, Jr.** Missions Specialists are **Mark C. Lee, Jay Apt, N. Jan Davis** and **Mae C. Jemison.** Japan's **Mamoru Mohri** will the payload specialist.

Spacelab J's primary objective is to use the space environment to address important scientific and technical questions in materials science, life science and technology. The joint mission will emphasize international cooperation of governments, industry and academia in an evolving partnership to explore and develop the potential of the space environment. The mission also will add to the growing base of experience in preparation for the start of Space Station operations later this decade. ["Launch Advisory: NASA to Launch Joint US/Japanese Flight September 12", Sept. 1, 1992; Halvorson, FLORIDA TODAY, p. 1A, Sept. 1, 1992.]

KSC HURRICANE RELIEF EFFORT CONTINUES

Employees of Kennedy Space Center are uniting in their efforts to assist Hurricane Andrew victims in South Florida by donating food, supplies and cash. KSC is encouraging its 20,000-plus employees to bring in additional supplies to various drop points around the center so they can be properly packaged for delivery to those areas hit hardest by the storm. Items employees are being asked to bring include all types of baby products and food, meal-type canned foods, an assortment of camping gear, large family-size tents, flashlights, batteries, can openers, trash bags and personal hygiene items. **Lou Phillips**, a packaging specialist for NASA, is assisting in the effort to properly package the items brought in for South Florida residents. "We will be spending the next day making food packs for small, medium and large families so they can be handed out easily," Phillips said. "We will also be sending a lot of excess building materials that we have on hand here at KSC."

Materials from KSC employees will be gathered through tomorrow in time for a convoy of at least three 40-foot long flat-bed trucks to leave KSC Thursday morning. Contributions coming in after Wednesday will be transported to South Florida later. Cash donations are also being accepted through a special fund established with the Salvation Army in Titusville. The effort to collect needed items will continue throughout the next several weeks. Last week a convoy of nearly a dozen trucks and cars packed with durable goods left Kennedy Space Center en route to South Florida to assist residents hit hardest by Hurricane Andrew. NASA and its KSC contractors began mobilizing soon after the storm passed to do whatever possible to assist the nearly 250,000 people left homeless and hungry in Andrew's wake.

Friday morning, August 28, three 5,000-gallon water tankers led the convoy on the five-hour drive, followed by two 40-foot tractor trailers loaded with an assortment of relief items for the people of South Florida. Included on the trucks were: meal packets, sleeping cots, blankets, mattresses, tents, tables, shelves, chairs, generators, plywood, rope, wire fencing, tool boxes and a three-ton hoist. The water tankers will remain in the Homestead, FL, area for an indefinite period of time. Everything sent down last week was excess material over and above what is required to be kept at KSC for the center's own hurricane plan.

"The group, made up of about 16 NASA and contractor employees, dispatched the wares from a darkened Homestead Pizza Hut parking lot late Friday night," said Cal Staubus, NASA's Fire and Rescue Office Chief and convoy commander. "Everything was given away." On August 26, six EG&G Florida Fire Services personnel headed down to Miami to assist local emergency personnel with rescue efforts. They took with them a rescue/extraction vehicle from KSC. While there, the crews assisted with search and rescue, emergency response, and hospital field work efforts. This team was among the first outside fire/rescue personnel to respond to the need. They are providing around-the-clock assistance on a continual basis. [NASA/KSC News Release No. 119-92, Sept. 1, 1992; Banke, FLORIDA TODAY, p. 5A, Sept. 3, 1992.]

September 2: **STS 47: FRR COMPLETED**

Shuttle managers at Kennedy Space Center have completed the Flight Readiness Review for STS 47; the managers have picked September 12 as launch day contingent on further troubleshooting the 2-inch gaseous oxygen line quick disconnect valve near the main propulsion system's 17-inch liquid oxygen umbilical. Technicians have also finished loading hypergolic fuels onboard the Orbiter. Work in progress: open pad for normal operations following hypergolic loading operations and launch countdown preparations. Work scheduled: auxiliary power unit leak checks; Orbiter aft closeouts. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 2, 1992.]

COLUMBIA: STS 52 MISSION PREPARATIONS

Technicians have installed auxiliary power units and fuel cells storage tank set number 5 in the Space Shuttle Columbia which is being processed in OPF Bay 1 for its upcoming STS 52 mission. The Orbiter's payload bay doors have been cycled. Work in progress: forward reaction control system electrical mates and checks; Orbiter-payload interface verification tests; ammonia boiler servicing; orbital maneuvering system electrical redundancy checks; remote manipulator system (RMS) verification checks. Work scheduled: auxiliary power unit hook-ups; external tank mate with solid rocket boosters (on hold pending resolution of VAB 250-ton crane status. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 2, 1992.]

STS 53/DOD: DISCOVERY PROCESSING

Discovery's crew equipment verification test and crew module leak checks have been completed in OPF Bay 3. Work in progress: deservicing freon coolant loop #1; hydraulic line fill and bleed operations; main propulsion system leak checks; auxiliary power unit leak checks; cabin vent valve replacement. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 2, 1992.]

ATLANTIS: MODIFICATIONS PERIOD CONTINUES

In OPF Bay 2, the RMS has been removed from the cargo bay of Atlantis prior to is ferry flight to California for extensive modification work. Work in progress at KSC: main propulsion system leak checks; deservice payload bay active cooling system; removal of power reactant and storage distribution system tanks sets numbers 3 and 4; removal of the Orbiter's three main engines. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 2, 1992.]

MARS OBSERVER LAUNCH RESCHEDULED

NASA today rescheduled the launch of Mars Observer aboard a Titan III rocket from Launch Complex 40 for Friday, September 25. The launch window extends from 12:27 to 2:27 p.m. EDT. The payload cleaning has been completed and re-encapsulation will begin tonight. The payload will be transported from Kennedy Space Center to Complex 40 on Cape Canaveral Air Force Station late on Thursday night, September 3, and mated to the Titan III rocket early on Friday morning, September 4. A countdown dress rehearsal is scheduled for September 17. Because there is no contingency in this schedule, the launch date will be reviewed after the countdown test. Additional precautions have been taken at the launch pad and with the spacecraft to assure that recontamination is unlikely to occur. [NASA/KSC News Release No. 120-92, Sept. 2, 1992.]

ENDEAVOUR LAUNCH: "TOTALLY MAKABLE"

NASA officials continue to believe that a leaking oxygen line aboard Endeavour can be repaired sufficiently soon so that the Orbiter will launch on time on September 12. "It's totally makable," said KSC spokesman **Mitch Varnes**. The leak is from a seal where the gaseous oxygen lines from the Orbiter and the external tank connect to each other. Officials have said that the leak occurs only when exposed to pressures greater than those normally used during launch. The problem was detected during a special high-pressure check earlier in the week. [Banke, FLORIDA TODAY, p. 3A, Sept. 3, 1992.]

September 3:

ENDEAVOUR: EVA SUIT ADDED

At Launch Complex 39B, Endeavour is being readied for its STS 47 flight scheduled for September 12. Work completed: loading of hypergolic fuels on board the Orbiter; auxiliary power unit leak checks; installation of contingency Extravehicular Mobility Unit into the Orbiter. Work in progress: launch countdown preparations; continued troubleshooting of the 2-inch gaseous oxygen line quick disconnect valve near the main propulsion system's 17-inch liquid oxygen umbilical; Orbiter aft closeouts; EVA suit functional checkout. Work scheduled: leak checks on reassembled 2-inch gaseous oxygen line quick disconnect September 4; ordnance operations September 5; countdown scheduled to pick up at T-43 hour mark at 3:00 a.m., September 9.; the STS 47 crew is scheduled to arrive at KSC on the morning of September 9. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 3, 1992.]

STS 52: LAGEOS FLIGHT PREPARATIONS

Remote manipulator system (RMS) verification checks have been completed on Columbia which is undergoing STS 52 mission processing in OPF Bay 1. Other work completed: auxiliary power unit hook-ups; ammonia boiler servicing; installation of fuel cells storage tank set number 5. Work in progress: forward reaction control system checks; Orbiter-payload interface verification tests; orbital maneuvering system electrical redundancy checks. Work scheduled: external tank mate with solid rocket boosters (on hold pending resolution of VAB 250-ton crane status.) [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 3, 1992.]

DISCOVERY: OPF BAY 3 PROCESSING

APU number 3 has been installed in Discovery which is undergoing processing in OPF Bay 3. A cabin vent valve has been replaced and hydraulic line fill and bleed operations are complete to date. Work in progress: installation of drag chute; deservicing of freon coolant loop #1; main propulsion system leak checks; APU leak checks. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 3, 1992.]

ATLANTIS: PRE-FERRY FLIGHT MODIFICATIONS

The three main engines of Atlantis have been removed while the Orbiter undergoes preliminary modifications in OPF Bay 2. The RMS has also been removed from the vehicle's cargo bay. Work in progress: deservice of the payload bay active cooling system and removal of the power reactant and storage distribution system tanks sets numbers 3 and 4. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 3, 1992.]

September 4:

STS 47: EVA UNITS INSTALLED

Contingency extravehicular mobility units have been installed in Endeavour and a functional checkout of the spacesuits has been completed. The Space Shuttle Endeavour remains poised for launch September 12 on its STS 47 mission at Launch Complex 39B. Work in progress: launch countdown preparations; troubleshooting continued on the 2-inch gaseous oxygen line quick disconnect valve near the main propulsion system's 17-inch liquid oxygen umbilical. Reassembly of the line is in progress and leak checks of the system are planned for tonight. Orbiter aft closeouts; installation of crew escape pole; ordnance range safety checks. Work scheduled: ordnance operations (September 5); purge of the external tank (September 8); countdown scheduled to pick up at the T-43 hour mark at 3:00 a.m., September 9. The STS 47 crew is scheduled to arrive at Kennedy Space Center on the morning of September 9. [Banke, FLORIDA TODAY, p. 2A, Sept. 4, 1992; KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 4, 1992.]

COLUMBIA: STS 52 PROCESSING

In OPF Bay 1, technicians have completed servicing Columbia's ammonia boiler and the installation of fuel cells storage tank set number 5. Work in progress for STS 52: forward reaction control system checks; orbital maneuvering system electrical redundancy checks; remote manipulator system (robot arm) checkouts; main engine electrical checks and heat shield installation and retest of auxiliary power unit number 1. Work scheduled: Orbiter-payload interface verification tests; external tank mate with solid rocket boosters (on hold for no earlier than the morning of September 9 pending resolution of the VAB's 250-ton crane status.) [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 4, 1992.]

DISCOVERY & ATLANTIS: PROCESSING

Discovery remains in OPF Bay 3 where it is being processed for its STS 53 mission for the Department of Defense. Work in progress: deservicing freon coolant loop #1; main propulsion system leak checks; auxiliary power unit leak checks; nose wheel steering checks; payload interface verification tests; drag chute electrical connections. Atlantis is being prepared in OPF Bay 2 for its ferry flight to Palmdale, CA, where it will undergo extensive modification at the Rockwell International plant in Palmdale. Work completed: the removal of the power reactant and storage distribution system tanks sets numbers

3 and 4; removal of the Orbiter's three main engines; removal of the robot arm from the payload bay. Work in progress: deservicing of the payload bay active cooling system; aft bay clean-ups; auxiliary power unit flush. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 4, 1992.]

September 5: **LEVITT WINS SILVER SNOOPY**

Jeff Levitt, a McDonnell Douglas Space Systems employee for the last 10 years, received the Silver Snoopy Award recently from astronaut **James H. Newman.** Levitt was rewarded for his role in troubleshooting a problem with the Hubble Space Telescope. **George Faenza,** Vice President and General Manager of McDonnell Douglas at KSC said, "Jeff is the embodiment of an aggressive, exceptional engineer who taught the principles of Total Quality Management long before TQM became our performance standard." "KSC Worker Pinned With Snoopy Award," FLORIDA TODAY, p. 9E, Sept. 6, 1992; SEE ALSO: Eisler, FLORIDA TODAY, p. 1A-2A, Dec. 12, 1992.]

DRAG CHUTE TEST PLANNED

Referring to the special drag chute test which will be performed at the landing of Endeavour, NASA spokeswoman **Kari Fluegal** said, "This is the first test of the drag chute in an operational sense." All Orbiters will be fitted with drag chutes as part of modifications mandated after the Challenger accident. Two limited tests of the drag chute have been performed - on Endeavour and Columbia - during which the chute was deployed only after the nose wheel had touched down on the runway. [Halvorson, FLORIDA TODAY, p. 10E, Sept. 6, 1992.]

SHUTTLE UPDATES

Endeavour is at Launch Complex 39B where technicians are readying the Orbiter for its week-long Spacelab-Japan mission. The seven-member crew will arrive at KSC on September 9, just after the countdown for the STS 47 mission has begun. Atlantis is in OPF Bay 2 where workers are preparing the vehicle for a year of modifications at Rockwell International's Palmdale, CA, plant. Atlantis will be ferried to California aboard the Shuttle Carrier Aircraft next month. Discovery is being processed in OPF Bay 3. In November the Orbiter will fly a classified mission for the Department of Defense. Columbia, the senior Space Shuttle, is being processed for a flight scheduled for next month, STS 52. Currently technicians are working on the vehicle's hydraulic system and checking connections on the Shuttle's three main engines. ["Orbiter Update," FLORIDA TODAY, p. 10E, Sept. 6, 1992.]

September 6: **DELTA/ENDEAVOUR LAUNCH THIS WEEK**

In the early morning hours of September 9, a Delta 2 launch vehicle will lift off from Cape Canaveral Air Force Station's LC 17; the Delta's window extends from 4:57 a.m. until 5:24 a.m. The Air Force rocket will orbit the 15th Navstar satellite, part of the Navstar Global Positioning System Satellite Network. In the mid-morning of September 12, NASA will launch Endeavour on its second Shuttle mission, STS 47. Endeavour's window is from 10:23 a.m. until 12:53 p.m. [Brown, FLORIDA TODAY, p. 1A, Sept. 7, 1992.]

September 8: **STS 47: WEATHER LOOKS GOOD**

Forecasters are predicting an 80 percent chance of having acceptable weather conditions at launch time on September 12. Crew members are scheduled to arrive September 9 at the Shuttle Landing Facility. Work in progress: preparations to start the STS 47 launch countdown; purges of the external tank; pulling work platforms out of the aft compartment; stowing gear in the crew module. Work scheduled: installation of aft compartment doors for flight is planned for tonight; begin launch countdown at 0300 tomorrow; move rotating service structure away from the vehicle at 1100 September 11; loading of hypergolic cryogenic propellants into the external tank at 0203 September 12; launch at 10:23 a.m. EDT September 12. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 8, 1992.]

OPF PROCESSING ACTIVITIES

While the youngest Orbiter in the Space Shuttle fleet - Endeavour - is being readied for its STS 47 launch on September 12, the other three vehicles are each in an Orbiter Processing Bay undergoing Shuttle Processing Operations. Columbia is in OPF Bay 1 where the following processing work was in progress: checking out the forward reaction control system; verification of the remote manipulator system (RMS); minor repair of radiators; closeouts of the vehicle; main engine interface leak checks. Discovery, in OPF Bay 3, had leak tests of the crew module completed. Work in progress: leak and functional tests of the auxiliary power units; installation of its drag chute; integrated testing of the main propulsion system; testing of the vehicle's Ku-band antenna. Atlantis, being readied for its ferry flight to California for intensive modifications, is housed in OPF Bay 2 where it is undergoing preparations to flush the auxiliary power units; preparations to deservice the freon cooling system; removal of tacan antennas and the radar altimeter. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 8, 1992.]

September 9: **DELTA LAUNCH A SUCCESS**

At 4:57 a.m., the Air Force launched a Delta II rocket from Cape Canaveral Air Force Station's Launch Complex 17. The rocket carried a NAVSTAR Global Positioning System Satellite into orbit, the fifteenth such satellite in the system. "We're a pretty happy bunch of people at this point," said flight commentator **Skip Mackey**. The launch was the 15th successful liftoff of Navstar satellites. It was the second Delta launch from Cape Canaveral in 10 days. The Air Force and the 45th Space Wing at Patrick Air Force Base will now be prepared to assist at Eastern Test Range for the launch of Endeavour on Saturday morning. [Banke, FLORIDA TODAY, p. 1A, Sept. 8, 1992; "Delta Rocket Scheduled to Lift Navigation Satellite Into Orbit," FLORIDA TODAY, p. 6A, Sept. 9, 1992; Halvorson, FLORIDA TODAY, p. 2A, Sept. 10, 1992.]

STS 47 CREW ARRIVES AT KSC TODAY

The seven-member crew of the Space Shuttle Endeavour arrived at Kennedy Space Center's Shuttle Landing Facility this morning at approximately 8:30 a.m. "We're all excited about the idea of getting ready to go into space," said Commander **Robert L. "Hoot" Gibson**. "We think we have some exciting things we are going to get a chance to look into and investigate." The crew also includes Pilot **Curtis L. Brown, Jr.** and Mission Specialists **Jay Apt, Mae C. Jemison, Mark C. Lee** and **N. Jan Davis** (who will be the first married couple in space) and **Mamoru Mohri**, a Japanese astronaut. Apt, Jemison and

Davis, will bed down shortly after arrival, while the remainder of the crew will eat lunch and attend Shuttle and payload status briefings. "They are getting acclimated to the schedule they'll be working during the flight," said KSC spokeswoman **Lisa Malone**. Asked about progress in pre-launch operations, Malone said, "We're doing great at the pad. We're pressing on for a launch Saturday [September 12] and we don't expect any problems." If the launch goes as scheduled, a landing would occur at KSC at 6:59 a.m. on September 19. The three-day countdown also got underway today at . [Halvorson, FLORIDA TODAY, p. 6A, Sept. 9, 1992; Halvorson, FLORIDA TODAY, p. 2A, Sept. 10, 1992; Hoversten, USA TODAY, p. 2A, Sept. 11, 1992.]

September 10: **QUAYLE TO WITNESS STS 47 LAUNCH**

Vice President **J. Danforth Quayle** will be on hand at Kennedy Space Center to witness the second launch of Endeavour on its STS 47 mission September 12. The vice president will meet with the families of the STS 47 crew before the launch; after the liftoff he will address the launch team. "We're looking forward to eating beans with the vice president," said Shuttle Launch Director **Robert B. Sieck**. A meal of beans and cornbread is a tradition following every Shuttle launch. Quayle is chairman of the National Space Council and has visited KSC twice previously, in February and May 1991. After the launch, the Quayles will fly to South Florida to tour the hurricane damage in Homestead, FL. ["KSC Readies for Quayle Visit," FLORIDA TODAY, p. 2A, Sept. 10, 1992; OFFICE OF THE VICE PRESIDENT, "Visit of the Vice President and Mrs. Quayle to Cape Canaveral, Florida, Sept. 12, 1992; Banke, FLORIDA TODAY, p. 1A, Sept. 11, 1992.]

HYDROGEN REACTANTS LOADED

Technicians at Launch Complex 39B have loaded liquid oxygen and liquid hydrogen reactants into Endeavour for use by the fuel cells. STS 47 remains on target for a September 12 liftoff. Crew activities: Commander **Robert L. "Hoot" Gibson** and Pilot **Curtis L. Brown, Jr.** flew in the Shuttle Training Aircraft this morning. Crew members receive a medical exam today, review flight data files and collect baseline data. Work in progress: preparations to disconnect the Orbiter midbody umbilical unit used to load cryogenic reactants into the Orbiter's onboard fuel cell storage tanks; activation of the Orbiter's communications system; preparations to load time critical experiments into the Spacelab module including the frogs and fish; countdown clock enters a planned 4-hour built-in hold at the T-19 mark. Loading the animals into Endeavour requires that two McDonnell Douglas Space Systems technicians be lowered by rope from the crew cabin down a 20-foot-long tunnel to the opening of the Spacelab. Work scheduled: moving the rotating service structure away from the vehicle at 1100 a.m. September 11; begin loading cryogenic propellants into the external tank at 0203 September 12; crew wake-up time on September 12 is at 4:58 a.m. for the blue team and at 5:28 a.m. for the red team; crew breakfast is at 5:58 a.m. September 12 with departure of the flight crew for the LC 39B at 7:08 a.m. Launch is set for 10:23 a.m. EDT September 12. Forecasters are predicting an 80 percent chance of having acceptable conditions at launch time. The main weather concern is thunderstorms and the clouds left over after the storms dissipate. [KSC SHUTTLE STATUS REPORT, 10 a.m.. Sept. 10, 1992; Banke, FLORIDA TODAY, p. 7A, Sept. 11, 1992.]

COLUMBIA: STS 52 PROCESSING

TACANS number 1 and 3 are being replaced on Columbia while the Orbiter is being processed for STS 52 in OPF Bay 1. Other work in progress: checkout of the forward reaction control system; tests of the robot arm; closeouts of the vehicle; main engine interface leak checks. Work scheduled: transfer of the Orbiter to the Vehicle Assembly Building next week for mate with the external tank and boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m.. Sept. 10, 1992.]

DISCOVERY: DRAG CHUTE DOOR INSTALLED

In OPF Bay 3 technicians have installed Discovery's drag chute door. Work in progress: electrical redundancy testing of the orbital maneuvering system and reaction control system; leak and functional tests of the auxiliary power units; integrated testing of the main propulsion system; testing of the Ku-band antenna. [KSC SHUTTLE STATUS REPORT, 10 a.m.. Sept. 10, 1992.]

ATLANTIS: MODIFICATION PERIOD CONTINUES

Technicians have flushed the auxiliary power units of Atlantis while the Orbiter in OPF Bay 2 awaits its ferry flight to Palmdale, CA, for extensive modifications. Other work in progress on the vehicle: transfer of the power reactant storage and distribution system tanks to the Logistics Facility for storage; removal of auxiliary power unit lines; preparations to deservice freon cooling system; removing TACAN antennas and the radar altimeter. [KSC SHUTTLE STATUS REPORT, 10 a.m.. Sept. 10, 1992.]

September 12: **50TH SHUTTLE LAUNCH SUCCESSFUL**

Endeavour's launch was the first post-Challenger Shuttle launch to take place on time at 10:23 a.m. EDT. Mission Specialist **Jay Apt** said, "I've got to tell you this is a great way to commute to work." NASA spokesman **James Hartsfield** said, "It was loud - louder than normal." **Giselle Altmann**, a receptionist at Kennedy Space Center said, It was awesome. I enjoy the feel of the launch more than the visual aspect. The Earth shaking, car alarms ringing. I call it 'rolling thunder'." Next to God, it's the most powerful thing I know." Launch Director **Robert B. Sieck** noted that the launch was merely seven-hundredths of a second late. He said, "Looks close enough for government work." [Halvorson, FLORIDA TODAY, pp. 1A-2A, Sept. 13, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-15, Sept. 13, 1992; KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 14, 1992.]

QUAYLE: 'GOOD LUCK AND GODSPEED'

Vice President **J. Danforth Quayle** was on hand today to view the Shuttle Endeavour's second launch. About 20 minutes before launch, the vice president radioed to the crew: "On behalf of the president and all Americans, we just wish you and your crew good luck and Godspeed. We know it's going to be great." Mission Commander **Robert L. "Hoot" Gibson** replied, "Thank you, sir. We very much appreciate your support and we look forward to having a safe and successful 50th launch of the Space Shuttle by the world's greatest launch team and we're very pleased to have you here today." [Coleman and Halvorson, FLORIDA TODAY, p. 1A, Sept. 13, 1992.]

LOCKHEED WORKERS HONORED

Bryan Baker (Edgewater, FL) was named Lockheed Space Operations Co.'s Employee of the Month and **Stephen Leonhard** (Mims, FL) was named the company's Supervisor of the Month. Baker has worked at Kennedy Space Center for 26 years and Leonhard has spent 13 years at KSC. Leonard said, "It makes you feel like they appreciate the work you do." ["2 KSC Workers Honored," FLORIDA TODAY, p. 9E, Sept. 13, 1992.]

September 14:

POST-LAUNCH REPORT

For the first time since STS 61-B, a Shuttle was launched on time Saturday at 10:23:00.0600 a.m. EDT. Endeavour's second launch marked NASA's 50th Space Shuttle launch. The STS 47 solid rocket boosters arrived at Hangar AF on Cape Canaveral Air Force Station at 16 and 1830 yesterday. Both boosters are secured in the work stands and engineers are performing an open assessment today. A preliminary look at the boosters indicates they are in good condition. Launch Complex 39B sustained a minimal amount of damage as a result of Saturday's launch. Mobile launcher platform number 2 will be moved from the pad to the refurbishment site tomorrow. Endeavour is scheduled to land on Saturday (September 19) at Kennedy Space Center's Shuttle Landing Facility at 6:59 a.m. EDT. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 14, 1992.]

COLUMBIA: LEAK CHECKS COMPLETED

In the course of preparing Columbia for its STS 52 mission, technicians have completed leak checks of the vehicle's crew module. Work in progress: cleaning of the payload bay; closeouts of the vehicle; tests of the hydraulic system; troubleshooting of the water system for the crystals by vapor transport experiment located in the middeck. Columbia's transfer from OPF Bay 1 to the Vehicle Assembly Building will occur September 18. Once in the VAB, Columbia will be bolted to its external tank and boosters. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 14, 1992.]

DISCOVERY/ATLANTIS PROCESSING

Discovery continues to undergo processing in OPF Bay 3. Work in progress: preparations to remove the left orbital maneuvering system pod for repairs of an oxidizer isolation valve. The pod will be transferred to the Hypergolic Maintenance Facility where repairs will be made. Other work: servicing of the potable water; testing of the Ku-band antenna; replacement of a regulator for a water spray boiler. Atlantis is in a modification period at KSC before its ferry flight to California for extensive changes and improvements. Work in progress: preparations to deservice the freon cooling system; removal of various components. Atlantis will be ferried to Palmdale, CA, in mid-October. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 14, 1992.]

LEE MADE PROCUREMENT DEPUTY

NASA Administrator **Daniel S. Goldin** announced today the appointment of **Deidre A. Lee**, a veteran aerospace acquisitions officer, as Deputy Assistant Administrator for Procurement. Lee, who managed a variety of procurement activities in both NASA and the Air Force, currently serves as the Executive Officer to NASA's Acting Deputy Administrator **Aaron Cohen**. "We are very fortunate to have a person with Deidre Lee's considerable experience and energy to fill this position at a time when we are undertaking

major reforms in NASA procurement activities," Goldin said. [NASA/KSC News Release No. 92-146, Sept. 14, 1992.]

September 15: **HANGAR AF: BOOSTERS STRIPPED**

At Hangar AF, blasts of high power water are stripping the exterior cork and thermal protective foam away from Endeavour's boosters' aft skirts. Both boosters will be disassembled and shipped back to the respective vendors for refurbishment. Mobile launcher platform number 2 will be moved from the pad to the refurbishment site tomorrow. Endeavour's landing continues to be scheduled for September 19 at Kennedy Space Center's Shuttle Landing Facility at 6:59 a.m. EDT. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 15, 1992.]

COLUMBIA: PREPARATIONS IN OPF BAY 1

Technicians are preparing Columbia for its STS 52 flight in Orbiter Processing Facility Bay 1. Work in progress: cleaning of the payload bay; closeouts of the vehicle; tests of the hydraulic system; preparations to replace the water accumulator for the crystals by vapor transport experiment located in the middeck. Transfer of the Orbiter to the VAB will occur no earlier than 0001 September 19; Columbia will then be bolted to its external tank and solid rocket boosters. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 15, 1992.]

DISCOVERY: OPF BAY 3 PROCESSING

Discovery is in OPF Bay 3; work in progress: preparations to remove the left orbital maneuvering system pod for repairs of an oxidizer isolation valve; transfer of left OMS pod to Hypergolic Maintenance Facility for repairs; leak and functional tests of the ammonia system; servicing of freon coolant loop number 1; servicing of the potable water; replacement of a regulator for a water spray boiler. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 15, 1992.]

ATLANTIS: MODIFICATIONS AT KSC CONTINUE

The Space Shuttle Atlantis began a period of modification at the conclusion of its recent STS 46 mission. Work in progress: installation of the forward reaction control simulator; preparations to deservice the freon cooling system; removal of various components. In mid-October, the vehicle will be shipped to Rockwell International's Palmdale, CA, plant for further, more intensive modifications. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 15, 1992.]

September 16: **ENDEAVOUR: LANDING LATE**

Hydrolasing activities are continuing on the boosters to remove exterior cork and thermal protective foam. Both boosters will be disassembled and shipped back to the respective vendors for refurbishment. Mobile launcher platform number 2 was moved from the pad to the refurbishment site yesterday. Endeavour's STS 49 mission has been extended one day pushing landing at Kennedy Space Center's Shuttle Landing Facility to Sunday morning at 7: 22 a.m. The extension was authorized to allow the astronauts more time to run experiments. "You have another 24 hours to enjoy those aurora," said astronaut **Charles D. "Sam" Gemar** speaking to the Endeavour crew from Mission Control in Houston. Commander **Robert L. "Hoot" Gibson** responded: "Gee Sam, everybody's frowning." [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 16, 1992.]

COLUMBIA: OPF BAY 1 PROCESSING

The Space Shuttle Columbia continues to undergo processing prior to its STS 52 mission. In OPF Bay 1 the work in progress includes: cleaning of the payload bay; closeouts of the vehicle; final brazing of gaseous nitrogen lines in the aft compartment; replacement of the water accumulator for the crystals by vapor transport experiment located in the middeck. Work scheduled: transfer of Columbia to the Vehicle Assembly Building no earlier than 0001 September 20 when the Orbiter will be mated to its external tank and solid rocket boosters; the STS 52 flight readiness review is set for October 1 and the launch is tentatively targeted for mid-October. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 16, 1992.]

DISCOVERY: SERVICING/TESTING COMPONENTS

Preparations are underway in OPF Bay 3 to remove Discovery's left orbital maneuvering system (OMS) pod for repairs of an oxidizer isolation valve; the pod goes to the HMF for completion of the repair work. Other work in progress: tests of the Ku-band antenna; electrical redundancy tests of the OMS and reaction control systems; leak and functional tests of the ammonia system; preparations to connect the auxiliary power unit lines; servicing of the freon coolant loop number 1 and the potable water. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 16, 1992.]

MODIFICATION OF ATLANTIS CONTINUES

In OPF Bay 2, Atlantis continues in the early phases of the major modification work which will be continued in mid-October in Palmdale, CA. Work in progress at KSC: installing the reinforced carbon chin panel; preparations to deservice the freon cooling system; tests of the main propulsion system. The installation of the forward reaction control simulator. Atlantis will be ferried to California on October 17. [KSC SHUTTLE STATUS REPORT, 11 a.m., Sept. 16, 1992.]

September 17: **CRIPPEN TO BRIEF NEWS MEDIA**

Several times a year Kennedy Space Center Director **Robert L. Crippen** meets with editors and other members of the media who are interested in what is happening at the space center, but do not get a chance to talk to him regularly. Crippen's next such meeting with the press is set for the afternoon of September 21 at 1:30. [NASA/KSC Release No. 126-92, Sept. 17, 1992.]

September 18: **ENDEAVOUR'S LANDING PLANS/KSC**

The Space Shuttle Endeavour is scheduled to land at Kennedy Space Center September 20, after spending eight days in space on Shuttle mission STS 47. The landing will mark the conclusion of the Orbiter's second mission which began at KSC on September 12. Landing had earlier been slated for September 19, but was extended to gather more science data. Landing of Endeavour at KSC's Shuttle Landing Facility (SLF) is currently planned for 7:19 a.m. EDT on orbit 126. Landing on that schedule will bring mission elapsed time to 7 days, 20 hours and 56 minutes. Deorbit burn is set to occur on orbit 125 at about 6:19 a.m. at 7 days, 19 hours and 56 minutes. There is a second landing opportunity at KSC at 8:53 a.m. on orbit 127. [See landing story below.] The main weather concern is the possibility of rain within 30 miles of Kennedy Space Center's Shuttle Landing Facility, according to **Gary Coen**, mission operations manager at Johnson

Space Center (Houston, TX). The decision to land will be made about 100 minutes before the scheduled touchdown; Coen added that it was very likely that the first landing opportunity would be bypassed. Two landing opportunities are also available at KSC on September 21, at 7:13 a.m. and 8:46 a.m. Should weather prevent a landing at Kennedy, opportunities are also available at Edwards Air Force Base, CA, on September 20 and 21, at 10:23 and 11:57 a.m. and 10:14 and 11:47 a.m., respectively.

KSC Ground Operations

Once the Orbiter is on the ground, safing operations commence and the flight crew will prepare the vehicle for post-landing operations. A new transport vehicle will be used for the first time on this mission; it will assist the crew by allowing them to egress and changeout of the re-entry suits more easily and quicker. This vehicle, called the Crew Transport Vehicle (CTV), was purchased from Continental Airlines at Denver for use at KSC. A similar CTV will be on hand at Edwards. The CTV and other KSC landing convoy operations have been in an "on- call" status since Endeavour launched September 12. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the Orbiter after landing, prepare the Orbiter for towing to the OPF and assist crew egress.

Convoy vehicles are stationed midway along the SLF. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the Orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant Umbilical Access Vehicles move into position at the rear of the Orbiter. After purge and coolant operations, flight crew egress preparations will begin and the CTV is moved into position at the crew access hatch located on the Orbiter's port side.

Once access to the vehicle is gained, a doctor will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle. Several hours after landing, the Orbiter will be towed to OPF Bay 1 for post-flight deservicing and preparations for the next mission, STS 54. Following departure from the SLF, the seven astronauts will be taken to their quarters in the O & C Building, meet with their families, undergo additional physical examinations and depart for the skid strip at Cape Canaveral Air Force Station for their flight back to JSC. The crew intends to depart for JSC about eight hours after landing. In the event a landing at KSC is not feasible and Endeavour lands at Edwards, an augmented KSC convoy team will be at the California site to safe the vehicle, disembark the crew and move the Orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day. [NASA/KSC News Release No. 129-92, Sept. 18, 1992; KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 18, 1992.]

COLUMBIA: PAYLOADS TO LC 39B

The payloads for Columbia's STS 52 mission have been transferred to Launch Complex 39B and the Orbiter's payload bay doors have been closed. Work in progress: repairing an hydraulic leak in the elevon actuator line; preparations for the positive pressure structural leak test; closeouts of the vehicle; transferring the STS 52 payloads into the Payload Changeout Room at LC 39B. Work scheduled: weight and center of gravity determination tomorrow; transfer of Columbia to the Vehicle Assembly Building September

20 for mating with its external tank and solid rocket boosters; flight readiness review in early October; launch in mid-October. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 18, 1992.]

DISCOVERY & ATLANTIS: PROCESSING ACTIVITIES

Discovery, in OPF Bay 3, is having its orbital maneuvering system crossfeed lines disconnected. The Orbiter is undergoing leak and functional tests of the auxiliary power units and is being prepared for removal of the left orbital maneuvering system (OMS) pod for repair of the system's oxidizer isolation valve. The pod itself will be transferred to the Hypergolic Maintenance Facility for repairs. Atlantis, in OPF Bay 2, is having its residual oxidizer and fuel hypergolic propellants offloaded. Both OPF bays 1 and 2 are closed to non-essential personnel both today and tomorrow during the hazardous operation. Atlantis work scheduled: tests of the OMS pods next week; deployment of the radiators next week; removal of fuel cells and installation of simulators in their place. The cross-country ferry to Palmdale, CA, is scheduled to start October 17. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 18, 1992.]

NASA/EPCOT: PLANT BIOLOGY EXPERIMENTATION

The time when astronauts will be required to grow their own food in space may still be many years away, but a pair of scientists from NASA's Kennedy Space Center and Walt Disney World's EPCOT Center are already mixing soil, planting crops and preparing for humankind's long-distance voyages of the future. Their goal is to see that food is not an issue when astronauts once again leave Earth orbit and move on to the moon, Mars or beyond. The arrangement is involves two of Central Florida's largest employers dedicating two of their most highly educated employees to a project in a field where neither conglomerate is best known. **Chris Brown**, Ph. D., a plant physiologist with The Bionetics Corporation, and **Andrew Schuerger**, Ph. D., plant pathologist based at The Land pavilion at EPCOT Center, joined forces just over a year ago and have since been experimenting with lighting, plants and various types of growing environments.

Working in a laboratory near The Land pavilion, Brown and Schuerger have not only studied plant development but also new ways of growing them. They are focusing on artificial lighting used to nourish and stimulate the plants. Rather than relying on fluorescent or high-pressure sodium lights which have been used before, the two scientists are instead using light emitting diodes (LEDs) - like those used to illuminate digital clocks and watches - to stimulate their crops. The two scientists are using blue and red light.

With a limited area to grow plants on Space Station Freedom, Brown and Schuerger were forced to modify their approach to the project. "Sodium or fluorescent lights work great in indoor laboratories here on Earth, but we're going have some substantially different circumstances once we start growing plants in space," said Brown. "The presence of humans and a less than ideal environment provides us with some unique challenges." Those challenges center around the intensity and types of lighting needed to invigorate and sustain plant life. Typical greenhouse lighting was bypassed because they produce short lifespans, poor energy efficiency, safety concerns with fragile glass lights and an intolerable amount of heat output. The idea of using LEDs as an artificial light source for plants is not a new one. Developed and marketed by Quantum Devices, Inc. (Barneveld, WS), the growth-spurring LEDs were first studied at NASA's Ames Research Center. Experimental studies have been undertaken by a handful of researchers from various

universities and private institutions, but none are known to be as extensive or fruitful as those conducted by Brown and Schuerger.

The LEDs are being tested for their usefulness in spaceships, but spin-offs of the research conducted by Brown and Schuerger will likely someday find its way into the commercial marketplace. The miniature LEDs - which can generate up to 1/2 the light intensity of mid-day sunlight - may have uses in commercial gardening, pest management and experimental growth chambers. "The technology is still early in the development, but I think LEDs could have far-reaching implications," said Brown. Schuerger added, "We're delving into a new area of plant research here. I'm involved because EPCOT Center and The Land pavilion are dedicated to the future and particularly futuristic research....It may be a while before the results of our studies fly in space or before their spin-offs are in your local garden shop, but we're confident that those days will come." [NASA/KSC News Release No. 128-92, Sept. 18, 1992.]

September 19: **WOODWORTH NAMED HONOREE**

Warren Woodworth (Lockheed Space Operations Co. engineer) has been named a 1992 Manned Space Flight Awareness honoree. He was given the award for his contributions as the Orbiter airframe structural lead engineer for Endeavour. ["Lockheed Engineer Wins Award," Photo, FLORIDA TODAY, p. 9E, Sept. 20, 1992.]

[] **ADMINISTRATOR GOLDIN TO SPEAK LOCALLY**

NASA Administrator **Daniel S. Goldin** will speak September 22 at the Brevard County Manufacturers Association and the Brevard Economic Development Corporation's Industry Appreciation '92. The dinner is to be held at 6:30 p.m. at the Cocoa Beach Hilton. ["Goldin to Speak at Industry Appreciation," FLORIDA TODAY, p. 9E, Sept. 20, 1992.]

September 21: **ENDEAVOUR LANDS AT KSC**

"Like they say in the commercial, 'it doesn't get any better than this'," said Kennedy Space Center Director **Robert L. Crippen** when Endeavour ended its eight-day STS 47 mission yesterday. Touchdown came at 8:53:24 a.m. EDT; it was a successful conclusion to the 50th Space Shuttle mission. Endeavour Commander **Robert L. "Hoot" Gibson** remarked after the landing, "We got to go have the fun. We got to go do the good part, but we very much appreciate what the Kennedy Space Center - the world's greatest launch team - did for us. They're now turning Endeavour around for the next mission. So, the mission is over and the mission continues."

Endeavour's landing was on Runway 33; the drag chute was deployed at touchdown and the total rollout distance was approximately 8,567 feet. This landing marked the 12th Shuttle landing at KSC. Nose gear touchdown came at 8:53:41 and wheels stopped at 8:54:11 a.m. The total mission elapsed time was 7 days, 22 hours, 31 minutes and 11 seconds. Endeavour logged at total of 3,310,922 million miles in space during its second flight. The vehicle was safed on the runway and Endeavour was parked inside the OPF by 3:47 p.m. Time-critical experiments were removed from the Orbiter overnight. Post-flight inspections and deservicing operations are underway.

Residual cryogenic propellants will be offloaded tonight; main engine drying operations are scheduled to begin today. Preliminary inspections indicate the vehicle sustained minor tile damage. Two tiles were damaged when the drag chute was deployed and two

tiles on the nose landing gear door may have to be replaced. Overall the vehicle appears to be in good shape. Access is being established to all areas of the vehicle. Preparations are in work to open the payload bay doors tomorrow. Removal of the Spacelab-J payload is set for Friday, September 25. [Brown, FLORIDA TODAY, pp. 1A-2A, Sept. 21, 1992; KSC SHUTTLE STATUS REPORT, September 21, 1992.]

COLUMBIA MOVED TO VAB

The Space Shuttle Columbia, the next Orbiter that KSC will send into space, was transferred to the Vehicle Assembly Building by 1:10 p.m. yesterday (September 20). Today technicians hoisted the vehicle above the transfer aisle floor and into high bay 1 where it will be bolted to its external tank and solid rocket boosters. Work scheduled: rollout to Launch Complex 39B is targeted for September 26. A terminal countdown demonstration test is set for October 1-2, followed by a flight readiness review and launch by mid-October. [KSC SHUTTLE STATUS REPORT, Sept. 21, 1992.]

DISCOVERY IN OPF BAY 3

Preparations are underway to remove the left orbital maneuvering system (OMS) pod of Discovery for repairs of an oxidizer isolation valve. The pod will be transferred to the Hypergolic Maintenance Facility where the actual repair work will be done. Discovery's landing gear struts are being pressurized for flight; the main landing gear wheels and tires are being installed and leak checks of the liquid hydrogen main propulsion system are underway. [KSC SHUTTLE STATUS REPORT, Sept. 21, 1992.]

ATLANTIS: OPF BAY 2 MODIFICATIONS

In OPF Bay 2, Atlantis is undergoing tests of the orbital maneuvering system pods; preparations to remove the fuel cells and star trackers and deservicing of freon coolant loop number 1. Work scheduled: deployment of the radiators this week; removal of fuel cells and installation of simulators in their place. Atlantis' ferry flight to Palmdale, CA, is set for October 17. [KSC SHUTTLE STATUS REPORT, Sept. 21, 1992.]

ENDEAVOUR "LOOKS CLEAN"

"It looks clean. It really does," said Endeavour's Processing Manager **John "Tip" Talone** the day after Endeavour landed at Kennedy Space Center. "It's in real good shape." He said that of the 30,00 tiles covering the vehicle, only four need replacement. All the animals which flew aboard the vehicle in experiments have been removed from the payload bay. These included: 155 tadpoles conceived in space and seven hatched in flight; 180 hornets; 7,600 fruit flies and 30 chicken eggs. Endeavour's next mission is scheduled tentatively for January 13. [Brown, FLORIDA TODAY, p. 1A, Sept. 22, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-4, Sept. 21, 1992.]

DISCOVERY: O-RING LEAK FOUND

A leak similar to the one that caused the Challenger accident has been spotted in a booster intended for the use of Discovery on its next mission. Early on the 18th a test showed that one of three o-rings was leaking slightly. Finding out which ring is leaking and why could delay Discovery's launch now tentatively set for November 10, according to Director of Shuttle Operations **Jim Harrington**. He said that the recent test was the first time a joint between segments had failed a check since flights resumed in 1988.

Harrington noted that the leak was tiny; it could not be seen or heard without special instrumentation. It was discovered because of a drop in pressure. Sensitive sound detectors will be used to locate the leak, he said. The joints have "all kinds of redundancy in there," said Harrington. He said, further, that the segments used on the redesigned rockets were safer than those used on Challenger. KSC Director **Robert L. Crippen** said that test directors don't want to use the SRBs unless every o-ring passes inspection. [Date, THE ORLANDO SENTINEL, pp. A-1 & A-10, Sept. 22, 1992.]

September 22: **SRB LEAK OBSERVED**

As part of the booster assembly process at Kennedy Space Center, special equipment is used to check for minute leakage past o-rings in the field joints. During these standard leak check operations on the right-center field joint of the STS 53 solid rocket boosters, a leak was observed by test engineers at the primary o-ring seal. As planned for contingencies such as this leak check anomaly, engineers are scheduled to de-stack the booster segment to inspect the seal and determine the cause of the leak. The o-ring will be replaced and engineers will conduct a thorough inspection and analysis of the original o-ring. Potential causes for the leak could include debris, contamination or improper seating of the o-ring. Cleanliness and contamination control precautions are emphasized during the assembly procedure and have been effective for the previous 150 field joint assemblies for the 25 flights of the redesigned solid rocket motors. In this instance the leak check performed its function by identifying an unusual condition which is being investigated.

"It's a small leak - most likely less than one-thousandth of an inch in diameter," according to NASA Project Engineer **Phil Weber.** "It's not audible, and it's not a physical, blowing leak. It's very possible that we may disassemble (the segment) and not even find anything wrong. We deal with problems with flight hardware on a day-to-day basis. That's what we do out here. The key is you have to have the procedure in place. It wasn't a big shock (when we found the leak.) We knew what to do," Weber said.

The leak check is performed on all field joints as part of the assembly process in stacking the boosters for flight. The test includes imposing high-pressure (1,000 psi) between the secondary and primary o-ring seals. Engineers monitor for any pressure increase between the capture feature seal and the primary. If any changes in pressure are noted during this test, the primary seal is suspect and fails the test. Leak checks are also performed at lower pressures, between the secondary and primary seals, and between the capture feature and primary seals. These follow on checks are performed only after passing the initial leak checks. Successful completion of the leak check procedures provides the final assurance that the assembled RSRM fully meets seal requirements. The STS 53 mission is currently targeted for a mid-November launch; impact of the destacking and o-ring replacement on the target launch date, if any, is still being assessed. ["STS 53 Redesigned Solid Rocket Motor Stacking Operations," Sept. 23, 1992; Brown, FLORIDA TODAY, p. 4A, Sept. 23, 1992; Date, THE ORLANDO SENTINEL, p. A-10, Sept. 23, 1992.]

CONGRESS: FREEDOM BUDGET NEARS APPROVAL

President Bush has won nearly all the money he sought for the budget of Space Station Freedom. Congressional negotiators for the House and Senate have agreed to a budget calling for the expenditure of $2.1 billion. Bush had asked for $2.2 billion. ["House-

Senate Negotiators Approve $2.1 Billion for Space Station Freedom," FLORIDA TODAY, p. 4A, Sept. 23, 1992; Holton, THE ORLANDO SENTINEL, p. A-1, Sept. 24, 1992.]

GOLDIN: PROCUREMENT RULES TO CHANGE

NASA Administrator **Daniel S. Goldin** said today that his agency's procurement rules will change to encourage small businesses to pursue contracts in the space program. "We need to open our arms to bring in small and disadvantaged businesses," he said. Goldin said he wanted to simplify procurement rules and set up an electronic bulletin board for companies to learn what NASA's needs are. "One of the challenges we face in our society is to focus not on our present problems, but on the future." ["NASA Chief Targets Small Businesses," FLORIDA TODAY, p. 2B, Sept. 23, 1992.]

September 23:

SRB UPDATE: STS 53

In the Vehicle Assembly Building high bay 3, workers began demating the two booster segments designated for the STS 53 mission last night. When the right forward center segment was demated from the right aft center segment this morning, a one-inch piece of one of the V-2 filler sections was found pinched between the tang and clevis. Officials have determined that this V-2 filler caused the leak that was detected September 18. Today's inspection of the three o-rings proved they were intact and undisturbed. No foreign debris or contamination was present in the joint. There are 8 sections of the V-2 filler sections that are held in position with grease and are press-fitted into place within the joint. The rubber V-2 filler sections are about four feet long, about a half inch wide and "U" shaped. The right forward center segment has been lowered down into the transfer aisle. Both joints are being cleaned, inspected and prepared for re-mate. New o-rings and V-2 filler sections will be installed. A leak check of the joint will be performed after the segments have been remated. The STS 53 mission is currently targeted for a mid-November launch. Impact of the destacking activities on the target launch date, if any, is still being assessed. ["STS-53 Solid Rocket Booster Update," 2 p.m., Sept. 23, 1992; Brown, FLORIDA TODAY, p. 4A, Sept. 24, 1992.]

September 24:

STS 52: MAIN ENGINE STATUS

Shuttle officials decided today to replace one of the three main engines (Engine Number 3) on Columbia during its stay at the launch pad. Columbia is scheduled to be transferred to Pad 39B at 12:01 a.m. October 3. It is expected that the engine replacement work will begin next week. After examining X-rays taken after manufacturing, engineers found indications of possible small cracks in the engine nozzle liquid hydrogen coolant manifold at the bottom of the nozzle. This manifold funnels supercold liquid hydrogen into tiny tubes inside the nozzle to provide cooling to the nozzle and other areas of the engine.

X-raying the areas of concern at the pad would require an involved process including removal of the main fuel valve. In the interest of time, another engine is being prepared in the Main Engine Shop for installation on Columbia. X-rays will be performed on a different area of main engine number 1 while the vehicle is in the VAB. Weld concerns on engine number 1 are in a different location than in engine number 3 and do not require removal of the main fuel valve. There are no concerns with engine number 2. Possible impacts to the STS 52 launch date, currently targeted for mid-October, are being assessed. ["STS 52 Main Engine Status," 4:30 p.m., Sept. 24, 1992.]

September 25: **COLUMBIA: ENGINE 3 A CONCERN**

Yesterday, officials decided to replace main engine number 3 of Columbia because of concerns of small welds in the nozzle's aft manifold. Performing x-rays of this particular area is an involved task and would require a significant amount of time. After evaluating options, it was determined that replacing engine number 3 at the pad is the prudent thing to do. X-rays of welds in a different location in the engine number 1 aft manifold are being taken today. There are no concerns with engine number 2. Work in progress: preparations to transfer the Orbiter to Launch Complex 39B; retracting platforms away from the vehicle; defoaming around the main engine number 3 interfaces in preparation for removal next week; x-rays of the welds in the engine number 1 aft manifold. Work scheduled: rollout to LC 39B targeted for 0001 Saturday (October 3); hot fire of the auxiliary power units Saturday night; moving the rotating service structure in place around the vehicle at 0400 October 4; terminal countdown demonstration test set for October 1-2; a flight readiness review is set for October 6. Launch is still targeted for mid-October. Referring to the engine changeout, KSC spokeswoman **Lisa Malone** said today, "We should know more by the end of the week." [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 25, 1992; Date, THE ORLANDO SENTINEL, p. A-4, Sept. 25, 1992; Banke, FLORIDA TODAY, p. 1A, Sept. 28, 1992; Halvorson, FLORIDA TODAY, p. 2A, Sept. 29, 1992.]

TITAN LIFTS MARS OBSERVER TO MISSION

At 1:05 p.m. this afternoon, the Mars Observer Spacecraft atop a Titan 3 rocket was launched from Cape Canaveral Air Force Station's Launch Complex 40. The launch was held up for 38 minutes while last minute pad work was completed. Then, after launch, the mission was in danger of failure while ground controllers struggled for an hour to communicate with the probe's Transfer Orbit Stage Booster rocket. The remaining problems with the probe are considered minor and not a threat to the mission. Mars Observer Program Manager **William Piotrowski** said, "We expect to arrive at Mars with a fully functional spacecraft." A global survey of the planet is expected to commence in mid-December 1993. [Banke, FLORIDA TODAY, p. 1A, Sept. 25, 1992; Banke, FLORIDA TODAY, p. 1A, Sept. 26, 1992; Banke, FLORIDA TODAY, p. 1A, Sept. 27, 1992; Hoversten, USA TODAY, p. 8A, Sept. 24, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-4, Sept. 25, 1992.]

DISCOVERY: CHECKS AND INSPECTIONS

In OPF Bay 3, technicians are at work on Discovery connecting auxiliary power unit fuel tank lines; servicing the potable water system; performing leak checks of the liquid hydrogen main propulsion system; preparing to replace a relief valve in the ammonia system and inspecting solenoid valves in the main propulsion system. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 25, 1992.]

ATLANTIS: MODIFICATIONS CONTINUE

Technicians have completed removal of the left orbital maneuvering system pod and the star trackers from Atlantis; they have also deserviced the Orbiter's freon coolant loop number 1. Work in progress: disconnecting the radiators for inspections; preparations to remove the right orbital maneuvering system pod and removing the auxiliary power unit controllers. Work scheduled: removing the radiators this weekend; ferrying Atlantis to Palmdale, CA, set for October 17. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 25, 1992.]

ENDEAVOUR: POST-FLIGHT INSPECTIONS, TESTS

Post-flight inspections and tests are the order of the day for the Space Shuttle Endeavour which has just completed its STS 47 mission with a landing at KSC. Other work in progress: validations of the Orbiter's power system; inspections of the windows; leak and functional tests of the main propulsion system helium system. On Endeavour's next mission, STS 54, a TDRS-F satellite will be deployed. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 25, 1992.]

STS 53 BOOSTERS

Work in progress on the STS 53 boosters includes: lifting the right forward center segment to the high bay for mating to the right center segment. The two segments are expected to be re-mated by tomorrow and a leak check will follow. The STS 53 mission is currently targeted for a mid-November launch; the impact of the destacking on the target launch date, if any, is still being assessed. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 25, 1992.]

September 26: ROCKWELL GETS KSC QUALITY AWARD

This year's Kennedy Space Center Excellence Award for Quality has been given to Rockwell International Corp., Space Systems Division Field Operations. A letter to Rockwell from KSC Director **Robert L. Crippen** to Rockwell Vice President and General Manager **Leroy D. Solid** said, "Your quality organization, in support of the Kennedy Space Center's Shuttle operations, was judged to be truly worthy of this prestigious award." Solid said, in reply, "Manned space flight demands a culture based on quality above all other considerations. It is gratifying to see Rockwell recognized for putting quality first." The award will be presented in October. ["Rockwell International Space Systems Receives KSC Excellence Award," FLORIDA TODAY, p. 2B, Sept. 26, 1992.]

September 28: JOB CUTS STILL FORECAST

Despite nearly complete funding for most of NASA's major programs, job cuts in the Shuttle Program are still forecast. **John Williams**, Lockheed Space Operations Co. spokesman said, "The budget is very positive as far as the long-term health of the Space Shuttle Program and the Space Station Program, which is good news for Brevard County." Nevertheless, Lockheed is anticipating layoffs in the range of 200 to 300 persons from its 6,000-plus work force. Most job losses, according to Williams, will come as the result of attrition. [Halvorson, FLORIDA TODAY, p. 1A, Sept. 29, 1992; Date, THE ORLANDO SENTINEL, p. A-13, Sept. 30, 1992.]

September 29: COLUMBIA: ENGINE 3 REMOVAL

Technicians at Launch Complex 39B have finished removing the heat shield from around main engine number 3 and have opened Columbia's payload bay doors to receive the STS 52 payload. The welds in main engine number 1 aft manifold show that there is no indication of defects; this was verified by X-raying the relevant components. Work in progress: removal of main engine number 3 from Columbia this afternoon and transfer of the payload into the Orbiter. Work scheduled: installation of replacement main engine number 3 tomorrow; launch readiness review for STS 52 tomorrow; terminal countdown demonstration test (TCDT) October 1-2; crew arrival for TCDT tomorrow at 11:30 a.m.; launch remains targeted for the third week of October. The STS 52 crew includes:

Commander **James D. Wetherbee**; Pilot **Michael A. Baker**; Mission Specialists **William M. Shepherd, Tamara E. Jernigan** and **Charles Lacy Veach**; Payload Specialist is **Steven MacLean**, who is from Canada. [KSC SHUTTLE STATUS REPORT, 10:00 a m., Sept. 29, 1992; Halvorson, FLORIDA TODAY, p. 4A, Sept. 30, 1992.]

DISCOVERY: STS 53 PROCESSING

In OPF Bay 3, pressurization of the auxiliary power unit lube oil has been completed. Work in progress: checks on the right hand Orbital Maneuvering System (OMS) pod; body flap closeouts; transport to the VAB of the right forward SRB segment for stacking. The left hand OMS pod is set for installation in Discovery tonight. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 29, 1992.]

ENDEAVOUR: SPACELAB J REMOVED FROM PAYLOAD BAY

Now in OPF Bay 1, the STS 47 mission cargo - Spacelab J -has been removed from the payload bay of Endeavour. Preparations are underway to remove residual hypergolic fuels; remove main engine heat shields; deservice the auxiliary power unit water and to conduct post-flight inspections. The right hand OMS pod has been removed from Atlantis and sent to the Hypergolic Maintenance Facility today. Technicians in OPF Bay 2 are troubleshooting the Orbiter's Ku-band antenna. [KSC SHUTTLE STATUS REPORT, 10:00 a.m., Sept. 29, 1992.]

COLUMBIA: PAYLOADS INSTALLED

The LAGEOS II (Laser Geodynamic Satellite) spacecraft was installed into Columbia's payload bay today in preparation for the upcoming STS 52 mission in October. LAGEOS was built by the Italian Space Agency (ASI) and is attached to an IRIS (Italian Research Interim Stage) booster, a low-cost spinning solid upper stage developed by the Italians for deploying moderate sized satellites from the Space Shuttle. USMP-1, the first in the U.S. Microgravity Payload series, was also installed into the payload bay today. The ten-day STS 52 mission will provide the flight duration necessary to achieve the desired microgravity science objective.

The next major activity for each of these payloads is an Interface Verification Test (IVT) which verifies the electrical connections with Columbia and ensures that the payloads will respond correctly when sent commands from the flight deck. The IVT for USMP is scheduled for October 2 and the IVT for LAGEOS/IRIS is scheduled for October 13. Project Management of LAGEOS II is by the Goddard Space Flight Center (Greenbelt, MD). Mission Management of USMP-1 is by the Marshall Space Flight Center (Huntsville, AL). Program Management for both payloads is by the Office of Space Science and Applications (NASA, Washington, D.C.). [NASA/KSC News Release No. 135-92, Sept. 29, 1992.]

STS 47 CALLED STEPPINGSTONE

Endeavour's STS 47 Commander **Robert L. "Hoot" Gibson** called his mission a landmark flight that should serve as a "steppingstone" for NASA's Space Station. "I think it's probably one of those flights that they'll look back on and say that it was a milestone," said Gibson. "It was the 50th [Space Shuttle] mission. We have gone through a lot of growing pains, a lot of learning processes in the course of flying those 50 missions. They haven't all flowed smoothly and they haven't all gone well, but it has been very definitely

a learning process for us and we are still learning. I think one of the biggest landmarks of this flight was our cooperation with the Japanese." Referring to the presence in his crew of husband and wife astronauts **Mark C. Lee** and **N. Jan Davis**, Gibson said, "The mission itself was conducted in a very professional way, and that's the entire story of the husband-and-wife couple on the mission," said Gibson. [Halvorson, FLORIDA TODAY, p. 4A, Sept. 30, 1992.]

September 30: **COLUMBIA: ENGINE #3 REMOVED**

At Launch Complex 39B the STS 52 payloads have been installed in Columbia and the Orbiter's No. 3 main engine has been removed. Work in progress: interface verification tests of the payloads; preparations to replace main engine number 3; check out of the booster hydraulic system; calibrations of the inertial measurement units; KSC launch readiness review; STS 52 crew arrival at approximately 11:30 a.m. Work scheduled: terminal countdown demonstration test October 1 and 2; flight readiness review October 6. Launch remains targeted for the third week in October. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 30, 1992.]

DISCOVERY: LEFT OMS POD INSTALLED

During processing activities in OPF Bay 3 the Space Shuttle Discovery has had its left orbital maneuvering system pod installed. Work in progress: electrically connecting the left OMS pod; checkout of the body flap; tests of the waste collection system; tests of the flight control system; purging of the main propulsion helium system. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 30, 1992.]

ATLANTIS DURING MODIFICATION AT KSC

The right orbital maneuvering system (OMS) pod of Atlantis has been removed and the potable water has been offloaded. Preparations are underway in OPF Bay 2 to install the simulator OMS pods and to conduct auxiliary power unit leak and functional tests. The ferry flight to California remains scheduled to occur on October 17; at Palmdale, CA, the Orbiter will undergo extensive modification of the sort done to Columbia and Discovery earlier. Endeavour, being processed in OPF Bay 1, is undergoing cycling of its external tank doors. Other processing activities: removing the main engine heat shields; post-flight inspections and tests; polishing of its windows and preparations to offload residual hypergolic propellants. [KSC SHUTTLE STATUS REPORT, 10 a.m., Sept. 30, 1992.]

MILITARY CONSTRUCTION CONTRACT AT KSC

Military Construction Co. (Merritt Island, FL) has been awarded a $224,377 fixed price contract for the installation of a fire detection system in the Vertical Processing Facility (VPF) at Kennedy Space Center. The VPF is the largest of the Shuttle vertical payload handling facilities at KSC. It features a 10,513-square-foot high bay area and an environmentally controlled "clean room" atmosphere. Although the contract was awarded September 15, 1992, work will not begin until April 1993. Until that time, scheduled Space Shuttle payload processing activities preclude access to the areas where the contract calls for 52 detection sensors to be installed.

The small business firm will provide the sensors, a new fire control panel and other materials, and install them. The ultraviolet/infrared detector sensors will be located in the facility's air lock, high bay and work stands that support the payloads while they are

being assembled and checked out prior to transport to the launch pad and integration into the Orbiter's payload bay. The sensors will be able to detect fire up to a distance of 40 feet, pinpoint its location and relay the information via the control panel to personnel in the VPF and the Complex 39 Launch Control Center for further action. [NASA/KSC News Release No. 134-92, Sept. 30, 1992.]

STS 52 CREW ARRIVES FOR TCDT

The six-member crew of Columbia's STS 52 mission arrived at Kennedy Space Center today to participate in the **terminal countdown demonstration test and in emergency egress and Shuttle landing practice. Commander **James D. Wetherbee** spoke for the crew on arrival: "In the next couple of days, we're going to borrow the vehicle for a little bit and get some practice in for ourselves." Launch day is now targeted for October 22. The remaining members of the STS 52 crew are Pilot **Michael A. Baker**, Mission Specialists **William M. Shepherd, Tamara E. Jernigan** and **Charles Lacy Veach**. The single Payload Specialist for the mission is **Steven MacLean**, a Canadian astronaut. A firm date will be set following the flight readiness review next week for Columbia's 13th mission. [Halvorson, FLORIDA TODAY, p. 2A, Oct. 1, 1992.]

OCTOBER

October 1: **COLUMBIA: IMUS CALIBRATED**

At Launch Complex 39B, technicians have calibrated Columbia's inertial measurement units in preparation for the Orbiter's STS 52 mission later this month. Work in progress: terminal countdown demonstration test began at 8 a.m. at the T-24 hour mark; preparations to replace main engine number 3 if acceptable wind conditions prevail; STS 52 flight crew will perform sharp edge inspection of the payload bay and practice emergency escape procedures at the pad. Work scheduled: conclusion of the terminal countdown demonstration test tomorrow; flight readiness review set for October 6. Launch is currently targeted for October 22. [KSC SHUTTLE STATUS REPORT, 10 a.m., Oct. 1, 1992.]

DISCOVERY: PAYLOAD BAY CLEANING

Discovery is currently being processed for its STS 53 mission in Orbiter Processing Facility Bay 3. The payload bay is being cleaned and technicians are conducting an interface verification test of the left orbital maneuvering system (OMS) pod; checking out the body flap; testing the communications, waste collection and the flight control systems. [KSC SHUTTLE STATUS REPORT, 10 a.m., Oct. 1, 1992.]

ATLANTIS: FUEL CELL SIMULATORS INSTALLED

With its ferry flight to California upcoming - October 17 - technicians in OPF Bay 2 have installed fuel cell simulators in the Space Shuttle Atlantis. The Orbiter is undergoing an intensive modification period. Preparations have been made to install the simulator OMS Pods and the left hand fixed radiators. Auxiliary power unit leak and functional tests are ongoing. [KSC SHUTTLE STATUS REPORT, 10 a.m., Oct. 1, 1992.]

ENDEAVOUR: CHIN PANEL REMOVED

Endeavour's chin panel has been removed following its return from the STS 47 mission. Work in progress: removing the Spacelab-J tunnel adapter and extension; removing the main engine heat shields; post-flight inspections and tests; polishing the windows; preparations to offload residual hypergolic propellants. [KSC SHUTTLE STATUS REPORT, 10 a.m., Oct. 1, 1992.]

WETHERBEE: "I'M NOT CONCERNED"

STS 52 Commander **James D. Wetherbee** said today, "I am not concerned in the least about the need to replace the engine [on Columbia]. They really do a good job down here, and I'm not concerned at all." Wetherbee referred to the changeout of the Orbiter's number 3 main engine which is nearing completion today. Another main engine may need replacement if an x-ray inspection shows the presence of cracks. Meanwhile, the crew is going about usual pre-flight training exercises. "They'll be going through the normal launch-day activities," said KSC spokeswoman **Lisa Malone** concerning the TCDT going on now at Launch Complex 39B. The practice concludes with a simulated launch at 11 a.m. The crew will return to Houston until October 20 when they arrive for the launch of STS 52 now targeted for October 22. [Halvorson, FLORIDA TODAY, p. 2A, Oct. 2, 1992.]

YOUNG HONORED FOR 30 YEARS SERVICE

Astronaut **John Young** was awarded the NASA Outstanding Leadership Medal today by NASA Administrator **Daniel S. Goldin** in a ceremony at NASA Headquarters (Washington, D.C.). "Today we're here to honor one of NASA's finest and an authentic American hero if there ever was one," Goldin said. "John Young first became an astronaut 30 years ago - September 1962 - back in the days when we were still flying Mercury spacecraft. He had the right stuff back before we even had a name for it. His first flight in space was with **Virgil "Gus" Grissom** aboard the very first Gemini flight," Goldin continued. "Later he flew with **Michael Collins** on Gemini 10. In 1969, John made his first trip to the Moon aboard Apollo 10 and returned three years later to become part of the world's most elite fraternity: one of the 12 men to walk on the Moon. For most people, that would have been enough accomplishment for one lifetime. But not John. He waited almost a decade, then became the ultimate test pilot by taking the Space Shuttle for its first flight into space. In 1983, he set a new record as the first man to make 6 flights into space."

Young, 62, currently serves as Special Assistant to the Director of the Johnson Space Center (Houston, TX) for Engineering, Operations and Safety. Prior to this assignment, he was Chief of the Astronaut Office from 1974 to 1987. During this period astronaut crews participated in the Apollo-Soyuz joint American-Russian docking mission, the Space Shuttle Approach and Landing Test program and 25 Space Shuttle flights. In addition to the Outstanding Leadership Medal, Young is the recipient of the Space Congressional Medal of Honor, 3 NASA Distinguished Service Medals and 70 other major awards. He also has been inducted into the National Aviation Hall of Fame. [NASA/KSC News Release No. 92-160, Oct. 1, 1992; "John Young Receives Leadership Medal," FLORIDA TODAY, p. 9E, Oct. 11, 1992.]

October 2:

COLUMBIA: ENGINE #3 REMOVED

Technicians at Launch Complex 39B successfully removed suspect main engine number 3 from Columbia yesterday. High winds had held up the operation until then. The STS 52 flight crew performed sharp edge inspections of the payload bay and practiced emergency egress procedures at the pad yesterday, as well. Work in progress today: the terminal countdown demonstration test was successfully concluded at 11 a.m. at the T-11 second mar; the replacement main engine was connected in place. KSC spokeswoman **Lisa Malone** said, "It was a good test, although had it been a real launch day, we would have had to hold for the (rainy) weather." The STS 52 crew departed KSC about 2 p.m. for a return to Houston, TX. Work scheduled: interface verification tests between the payloads and the Orbiter planned this weekend; helium signature leak test of the three main engines and main propulsion system on Wednesday (October 7); flight readiness review October 7; launch on October 22. [KSC SHUTTLE STATUS REPORT, 12 p.m., Oct. 2, 1992; Halvorson, FLORIDA TODAY, p. 4A, Oct. 3, 1992.]

DISCOVERY AND ATLANTIS

Discovery is undergoing tests of its main propulsion system in Orbiter Processing Facility Bay 3. Also underway: interface verification testing of the left orbital maneuvering system (OMS) pod; checkout of the body flap; tests of the waste collection system; final payload bay cleaning. Atlantis, now in a modification phase, will be ferried to Palmdale, CA, for further work on October 17. Meanwhile, work is in progress here: installation of the simulator OMS Pods; tests of the payload bay doors; installation of the roll-around wheels; modifications and inspections; installation of the left-hand fixed radiators.

[] **ENDEAVOUR: STS 54 PROCESSING**

The Spacelab-J tunnel adapter has finally been removed from Endeavour while the Orbiter has been in OPF Bay 1. The tunnel adapter aided access to the payload bay during Endeavour's recently completed STS 47 mission. Work in progress: functional test of the air data system; inspections of the radiators; removal of the main engine heat shields; preparations to offload residual hypergolic propellants. [KSC SHUTTLE STATUS REPORT, 12 p.m., Oct. 2, 1992.]

October 3: NEW THIRD ENGINE INSTALLED

Columbia had its number 3 main engine replaced today at Launch Complex 39B; technicians are now preparing to test the engine for leaks. The replacement occurred because NASA found a crack in a similar test engine's nozzle and did not want to take chances with Columbia's engine. Replacing the engine was more time efficient than analysis at the pad. A leak test of the entire main engine propulsion system will be conducted on October 7. [Brown, FLORIDA TODAY, p. 1A, Oct. 4, 1992.]

October 4: FRR LEADS TO FIRM STS 52 DATE

When NASA managers meet October 6 for the STS 52 flight readiness review, one of their objectives is to set a firm date for the launch of Columbia. That date is expected to be October 22. Earlier, Columbia's mission was targeted for the second week of October, but the replacement of a main engine caused pre-flight operations to fall behind. The replaced number 3 engine has now successfully passed a leak test at Launch Complex 39B; the entire propulsion system will be tested for leaks on October 7. ["NASA to Set Columbia's Date Tuesday," FLORIDA TODAY, p. 3A, Oct. 5, 1992.]

October 5: COLUMBIA: IVTS COMPLETED

At Launch Complex 39B, the Space Shuttle Columbia's number three main engine has been replaced and it has undergone several leak tests. Interface verification tests (IVTS) between the payloads the Orbiter have also been conducted. Work in progress: leak tests of the number 3 main engine; making ground connections to the Orbiter in preparation for loading hypergolic propellants into the Orbiter's onboard storage tanks. Work scheduled: helium signature leak test of the three main engines and main propulsion system on October 7. The flight readiness review begins October 6 and launch is targeted for October 22. [KSC SHUTTLE STATUS REPORT, 11 a.m., Oct. 5, 1992.]

[] **DISCOVERY: THRUSTER REPLACED**

A thruster on Discovery's right orbital maneuvering system pod has been replaced during the Orbiter's stay in OPF Bay 1. Work in progress: leak checks of the auxiliary power units; brake anti-skid test; functional test of the landing gear; tests of the main propulsion system and final payload bay cleaning. [KSC SHUTTLE STATUS REPORT, 11 a.m., Oct. 5, 1992.]

[] **ATLANTIS: INSTALLATIONS COMPLETED**

In OPF Bay 2, technicians have completed the installation into Atlantis of the right hand simulator OMS Pod and the left hand fixed radiators. Work in progress: installing the left

hand simulator OMS Pod; leak checks of the main propulsion system; installation of the ferry flight kit items. Extensive modifications of Atlantis will occur in Palmdale, CA, at the Rockwell International plant to which the Orbiter will be ferried October 17. [KSC SHUTTLE STATUS REPORT, 11 a.m., Oct. 5, 1992.]

ENDEAVOUR: RESIDUAL HYPERGOLICS DRAINED

In OPF Bay 1, technicians have offloaded the residual hypergolic propellants from Endeavour. Work in progress: removing the main engine heat shields; taking samples from the helium tanks; removing windows; functional tests of the forward reaction control system. [KSC SHUTTLE STATUS REPORT, 11 a.m., Oct. 5, 1992.]

October 6:

COLUMBIA STATUS REPORT

The Space Shuttle Columbia has had its number 3 main engine replaced at Launch Complex 39B and initial leak checks have been completed. Also concluded is an Interface Verification Test for the USMP payload with the Orbiter. Currently, the STS 52 flight readiness review is underway in the O & C's Mission Briefing Room. Other work in progress: APU #1 quick disconnect changeout; power-on testing; heat shield installation around the number 3 main engine; preparations for hypergolic propellant loading; preparations for the helium signature leak checks of the main engine and main propulsion system; CVTE payload power supply checkout. Scheduled work on October 7: helium signature leak check; USMP cryogenic servicing ; potable water sample. On October 8 and 9 technicians will undertake hypergolic storable propellant loading. On October 10, technicians will conduct the IRIS/LAGEOS payload interface verification test (IVT) with Columbia. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 6, 1992.]

AUTO-LANDING SCRATCHED

NASA has canceled a test of the Shuttle's automatic landing system planned for Discovery's next mission, STS 53. "We worked hard on it...and you never like to see something stopped that you've started," said astronaut **David M. Walker**, who is scheduled to command Discovery's upcoming launch. "On the other hand, no pilot that I know of prefers to let a machine land the vehicle instead of himself." He said the decision suits him fine. "I'm personally a lot happier just to be able to land (the Shuttle) myself rather than have to watch the machine do it and be prepared to take over if it didn't do it correctly." The rest of the five-person crew includes: Pilot **Robert D. Cabana** and Mission Specialists **Guion S. Bluford, James S. Voss** and **Michael R. U. Clifford.** [Halvorson, FLORIDA TODAY, p. 5A, Oct. 7, 1992.]

STS 52: OCTOBER 22 LAUNCH DATE TARGET

NASA managers today announced October 22 as the official launch date for the next Space Shuttle mission. KSC spokeswoman **Lisa Malone** said at the conclusion of the Flight Readiness Review that "there were no major issues that were identified that would prevent us from launching on Oct. 22." The STS 52 flight will see the Space Shuttle Columbia and her 6 person crew deploy a satellite developed by the United States and Italy to obtain precise measurements of the Earth's tectonic plates. A series of U.S./Canadian experiments also will be conducted during the mission. The launch window on October 22 opens at 11:16 a.m. EDT and extends for 2 and 1/2 hours. The mission duration for STS 52 is 9 days, 20 hours, 46 minutes. At the end of the mission

Columbia is scheduled to land at Kennedy Space Center's Shuttle Landing Facility in Florida. Mission Commander is **James D. Wetherbee** with **Michael A. Baker** serving as Pilot. Mission Specialists are **Charles Lacy Veach, William M. Shepherd** and **Tamara E. Jernigan. Stephen Maclean** is the payload specialist and the third Canadian to fly aboard the Space Shuttle. ["NASA Sets Date for STS 52 Space Shuttle Launch," Oct. 6, 1992; Halvorson, FLORIDA TODAY, p. 5A, Oct. 7, 1992; NASA/KSC News Release No. 92-88, Oct. 6, 1992.]

SPACE STATION GRANTS AWARDED

NASA has awarded approximately $15 billion in annual funding for 124 microgravity research grants to develop the research potential of Space Station Freedom as one of the nation's premiere science and technology assets. "These awards are a major step towards the Space Station Era of microgravity research," said **Robert Rhome**, Director of NASA's Microgravity Science and Applications Division, at agency headquarters in Washington, D. C. "The hardware and experiments developed from these grants could make Space Station Freedom a microgravity laboratory unrivaled by any other." The grants to the 119 researchers represent an increase of 70 percent in the number of investigators sponsored by the microgravity division. The division now sponsors nearly 200 scientific investigators and plans to expand to at least 300 before Space Station Freedom is operational in 1997. The selected investigators represent 60 universities, eight corporate or private laboratories, five government laboratories and four NASA centers. Nearly 500 proposals were submitted by scientists in response to the NASA research announcements in fluid dynamics, biotechnology, materials science and fundamental science. The proposals were evaluated by peer review panels of recognized experts in those areas. [NASA/KSC News Release No. 92-167, Oct. 6, 1992; Halvorson, FLORIDA TODAY, p. 9E, Oct. 11, 1992.]

RUSSIA/NASA SIGN AGREEMENTS

NASA and the Russian Space Agency (RSA) have signed two cooperative agreements in Moscow, in the areas of human space flight and Mars exploration. "Signing these two agreements is the next crucial step in expanding cooperative space activities with our Russian partners. We are very anxious to begin working on these important programs," said NASA Administrator **Daniel S. Goldin**. The Human Space Flight Agreement outlines the flight details of a Russian cosmonaut on the U.S. Space Shuttle, the flight of a U.S. astronaut on the Russian Mir Space Station and a joint mission including the rendezvous and docking of the Space Shuttle with the Mir Space Station.

The Mars '94 agreement is for the flight of two U.S./NASA scientific instruments on the Russian Mars '94 lander. The agreements were signed by Administrator Goldin and RSA Director **Yuri Koptev** during the first annual U.S./Russian Space Policy Consultations. Ambassador **Frank Wisner**, Under Secretary of State, headed the U.S. delegation and met with Russian Ministry of Foreign Affairs officials to review the U.S./Russian space relationship.

Human Space Flight Cooperation Agreement

An experienced cosmonaut will fly aboard the STS 60 Space Shuttle mission, scheduled for launch in November 1993. RSA has nominated Col. **Vladimir G. Titov** and **Sergei K. Krikalev** as the two cosmonauts who will undergo mission specialist training. One cosmonaut will be designated the prime crewmember and the other designated backup

crewmember. The cosmonauts are scheduled for arrival at NASA's Johnson Space Center (Houston, TX) in October 1992. A NASA astronaut will fly on a long-duration (more than 90 days) Mir Space Station flight. The flight's timing will coincide with a Shuttle docking flight in 1995. The astronaut will be flown to the Mir on a Soyuz spacecraft. The astronaut's duties will focus on science, particularly life sciences, as well as engineering and operational objectives.

Two NASA astronauts will receive full cosmonaut training with their cosmonaut crewmates at the Yuri Gagarin Cosmonaut Training Facility "Star City" near Moscow. They will begin training no later than 12 months prior to the agreed flight date. One astronaut will be selected as the prime crewmember and the other will be designated backup crewmember. NASA will transport two cosmonauts in the Space Shuttle to replace the two cosmonauts on board Mir. Life sciences experiments, involving the NASA astronaut and the two cosmonauts on board the Mir, will be conducted while the Shuttle and the Mir are docked. The NASA astronaut and the two cosmonauts who have been docked on the Mir will be returned in the Shuttle to the United States for continued post-flight life sciences experiments.

NASA Participation in the Russian Mars '94 Mission

The primary objective of this mission is to carry out further joint exploration of planet Mars in conjunction with the Russian Mars '94 mission. This may provide the opportunity for U.S. scientific instruments to be carried aboard the Russian spacecraft. This cooperation could significantly enhance the present Mars '94 mission and provide critical data for future human and robotic Mars missions. One U.S. instrument is the Soil Magnetic Properties Experiment, and the other is the Soil Reactivity/Composition Experiment. These will enable scientists to characterize the Martian physical and chemical surface environment. The soil magnetic properties experiment will use a magnet to collect and measure the magnetic minerals in the Martian soil. The soil reaction/composition experiment will provide chemical information about the volatile components in the Martian soil. [NASA/KSC News Release No. 92-165, Oct. 6, 1992.]

October 7: **STS 52: COLUMBIA STATUS**

At Launch Complex 39B, workers have completed: APU #1 quick disconnect changeout; galley water tank changeout; Space Shuttle main engine number 3 changeout and leak checks; USMP payload interface verification test with Columbia. Work in progress: power-on testing; heat shield and eye lid installation around SSME #3; preparations for hypergolic propellant loading; helium signature leak checks of the main engines and main propulsion system; USMP payload cryogenic servicing; CVTE payload power supply checkout; potable water sampling. Work scheduled: hypergolic storable propellant loading on October 8 and 9; IRIS/LAGEOS payload interface verification test with Columbia on October 10; flight readiness test on October 11. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 7, 1992.]

October 8: **PROPELLANT LOADING TODAY**

Loading of hypergolic propellants into the Space Shuttle Columbia begins today. George Diller, KSC spokesman, said, "Everything is pretty much just clicking along." The loading will begin about noon and continue until early this next morning. Prior to loading the helium signature leak test will be conducted to insure that no leaks exist. [Halvorson,

FLORIDA TODAY, p. 6A, Oct. 8, 1992; "Workers to Fill Shuttle's Fuel Tanks," FLORIDA TODAY, p. 5A, Oct. 10, 1992.]

[] **HELIUM TEST ON COLUMBIA GOES SLOWLY**

The helium signature leak test of Columbia's main engines went smoothly, according to KSC spokesperson George Diller who said, "Everything is just trucking along." The test did proceed more slowly than expected and that caused managers to delay loading propellants until tomorrow [October 9]. [Halvorson, FLORIDA TODAY, p. 6A, Oct. 9, 1992.]

October 9: **COLUMBIA STATUS REPORT: STS 52**

At Launch Complex 39B, technicians have completed a helium signature leak check of Columbia's main engines and main propulsion system. Other pre-launch work completed includes: payload bay door closure for hypergolic loading activities; APU #1 quick disconnect changeout; galley water tank changeout; main engine number 3 changeout and leak checks; main engine number 3 heat shield and eye lid installation; USMP payload interface verification test and cryogenic servicing and potable water sampling. In progress is oxidizer loading which requires the clearing of LC 39B of all but essential personnel. Scheduled work: fuel loading Saturday (October 10); reopen payload bay doors Saturday night; gaseous oxygen system leak check; IRIS/LAGEOS payload interface verification test with Columbia on Sunday (October 11); flight readiness test (FRT) on Sunday night; aft main engine compartment closeouts begin October 12; ordnance installation and hypergolic pressurization on Monday night; EMU (Extravehicular Mobility Unit) installation on Wednesday (October 14); external tank purges on Thursday (October 15); USMP payload cryogenic topoff/close payload bay doors on Tuesday (October 19). Launch is set for October 22 at 11:16 a.m. EDT and landing is planned for Kennedy Space Center at 7:02 a.m. EDT, Sunday (November 1). [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 9, 1992; Brown, FLORIDA TODAY, p. 1A, Oct. 11, 1992.]

[] **DISCOVERY: STS 53 STATUS REPORT**

In the Vehicle Assembly Building, technicians have completed stacking the solid rocket boosters for Discovery's upcoming STS 53 mission planned for the third week of November with a planned KSC landing six days later. Hydrogen and Oxygen have been delivered for the mission to Launch Complex 39A storage spheres. Discovery is still in OPF Bay 3 where workers have completed ammonia, water spray boiler and potable water servicing; potable water loop leak checks are also finished. Work in progress: auxiliary power unit checks; left OMS pad installation; test cycle of the right payload bay door; preparations in the VAB for ET/SRB mating on Tuesday (October 13); solid rocket booster joint closeouts in the VAB. Work scheduled: preparations for the APU thruster changeout on Sunday (October 11); hydraulic system testing; OMS electrical redundancy testing; OMS Pod leak checks; load mass memory units; aft structural leak checks; Orbiter positive pressure checks; position flight control surfaces for rollover to VAB; rollover to VAB and mate to ET/SRB stack on October 20. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 9, 1992.]

ATLANTIS: POWER DOWN COMPLETED

In OPF Bay 2, Atlantis has been powered down and its payload bay doors were closed Thursday (October 8) night. Work in progress: closeouts for the Orbiter's ferry flight to California for modifications; auxiliary power unit tank removal in preparation for that flight; installation and configuration of ferry flight pods. Work scheduled: ferry flight tail cone installation on October 13; beginning installation on Orbiter transporter on October 15; move to mate/demate device and mate to the 747 Shuttle Carrier Aircraft on October 16. The mated pair will depart Kennedy Space Center on Saturday morning, October 17. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 9, 1992.]

ENDEAVOUR: POST STS 47 WORK

Endeavour has undergone post STS 47 inspections in OPF Bay 1. Technicians have completed a forward reaction control system functional test and replacement of the payload bay floodlights. A Tracking and Data Relay Satellite mating to its IUS is complete in the VPF (Vertical Processing Facility). TDRS state-of-health checks are completed. Work in progress: drag chute installation; TACAN #2 retest; crew hatch functional check; installation of crew sleep restraints; landing gear deployment; orbital maneuvering system functional test; window inspections; main engine leak checks; external tank installation into test cell in the Vehicle Assembly Building; TDRS White Sands compatibility testing in the VPF. STS 54 work scheduled: installation of wheels and tires; OMS Pod functional testing; APU 1/3 hot lube oil flush; window polishing. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 9, 1992.]

PIONEER VENUS' CAREER ENDED

The Pioneer Venus spacecraft, which had been orbiting Venus since 1978, did not survive its passage through Venus' upper atmosphere at 3:22 p.m. EDT October 8. The spacecraft passed throughout the lowest part of its orbit, which repeated every 24 hours, at 3:22 p.m. EDT. During this period, the radio signal could not be tracked from Earth because Pioneer was hidden behind Venus. No radio signal could be detected from the spacecraft when it should have emerged from behind the planet. Project officials believe the spacecraft was disabled by the heat of friction with Venus' atmosphere, with spacecraft insulation and other fragile components melting or breaking off. Although the spacecraft's remains will continue to orbit Venus for a short while, no further data can be collected without the radio signal. Pioneer Venus made the first maps of Venus and has returned thousands of pictures of the planet over the past 14 years. [NASA/KSC News Release Number: N92-89, Oct. 9, 1992.]

October 12:

DELTA LAUNCH SUCCESSFUL

At 5:47 a.m. EDT this morning, McDonnell Douglas Space Systems Co. successfully launched its Delta 2 rocket from Cape Canaveral Air Force Station. "I think [the launch] demonstrates the competitiveness of the U.S. industry and the ability of the U.S. launch companies to compete internationally," said **Chuck Kline**, Associate Director for Program Affairs, Office of Commercial Space Transportation in the Department of Transportation. Aboard the rocket is a German communications satellite called Kopernikas, named for the 16th century astronomer. ["Delta Rocket to Lift Off," FLORIDA TODAY, p. 1A, Oct. 12, 1992; Photograph of Launch, FLORIDA TODAY, p. 1A, Oct. 13, 1992; Halvorson, FLORIDA TODAY, p. 4A, Oct. 13, 1992; Brown, FLORIDA TODAY, p. 1A, Oct. 11, 1992.]

October 13: **ORDNANCE INSTALLATION FOR COLUMBIA**

Technicians are ready today to install ordnance devices aboard the Space Shuttle in preparation for its launch on October 22. The explosives separate Columbia from Launch Complex 39B for liftoff and the Orbiter from its solid rocket boosters and the external tank after launch. Propellants have been loaded, according to George Diller, KSC spokesman. The interface verification test between the Orbiter and its payloads was completed successfully over the weekend, as well. Other completed work includes: RMS elbow camera installed; flight readiness test of main engines and flight control surfaces have been conducted; thermal protection system closeouts. Hypergolic tank pressurization is in progress. Work scheduled: aft main engine compartment closeouts; contingency EVA spacesuit installation; firepole installation; installation of flight crew equipment; ET purges; ordnance connections; filling of LC 39B cryogenic storage spheres; USMP payload cryogenic servicing; payload bay closeouts; validation of the pad's Firex system; pad/mobile launcher platform washdown. [Halvorson, FLORIDA TODAY, p. 4A, Oct. 13, 1992; SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 13, 1992; Banke, FLORIDA TODAY, p. 4A, Oct. 14, 1992.]

ATLANTIS STATUS

In Orbiter Processing Facility Bay 2, installation of the ferry flight tailcone is in work on the Orbiter Atlantis. OV-104 (Atlantis) will be placed on the Orbiter transporter on Thursday (October 15) and moved to the mate-demate device at the Shuttle Landing Facility on Friday (October 16); departure for Palmdale (CA) is at sunrise on Saturday morning (October 17). [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 13, 1992.]

October 14: **COLUMBIA: LAUNCH MINUS 8 DAYS**

At Launch Complex 39B, the Space Shuttle is eight days away from liftoff, set for 11:16 a.m. EDT, October 22. Workers have completed: initial ordnance installation; hypergolic tank pressurization; IRIS/LAGEOS Interface Verification Test (IVT) with Columbia; Flight Readiness Test of the vehicle's main engines and flight control surfaces. Work in progress: contingency EVA (Extravehicular Activity) spacesuit installation; Orbiter/External Tank cavity purge leak checks; IRIS/LAGEOS changeouts; auxiliary power unit leak checks; main engine number 3 gimbal check; carrier panel/heat shield installation; PRSD tank purges; countdown preparations and communication activation in FR (Firing Room) #3.

Work scheduled for October 15: aft main engine compartment cleaning/closeouts; firepole installation; ET purges; begin flight crew equipment stowage in crew cabin; Orbiter aft confidence test; auxiliary power unit closeout inspections. Work scheduled for October 16: cavity purge retest. Work scheduled for October 17: ordnance connections. Work scheduled for October 18: Orbiter aft positive pressure check; install Orbiter aft flight doors. Work scheduled for October 19: USMP payload cryogenic servicing; payload bay closeouts; pad/mobile launcher platform washdown/debris walkdown; begin STS 52 countdown at 4 p.m. The payload doors will be closed on October 20. In OPF Bay 2, installation of the ferry flight tailcone is complete on the Orbiter Atlantis. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 14, 1992; Banke, FLORIDA TODAY, p. 6A, Oct. 15, 1992.]

ATLANTIS FERRY FLIGHT

The Space Shuttle Atlantis will begin its cross-country ferry flight to the Rockwell International plant in Palmdale, CA, early Saturday morning (October 17) for a year-long series of structural inspections and modifications. Atlantis is scheduled to leave KSC atop the 747 Shuttle Carrier Aircraft at 7:30 a.m. on the 17th. Tomorrow morning, Atlantis will be towed from OPF Bay 2 to the mate-demate device located on the ramp at the Shuttle Landing Facility. The Shuttle Carrier Aircraft is expected to arrive at Kennedy Space Center early tomorrow morning. It will then be mated to NASA 911, the SCA, which will carry the Shuttle to California. [NASA/KSC News Release No. 142-92, Oct. 14, 1992; Banke, FLORIDA TODAY, p. 6A, Oct. 15, 1992.]

October 15:

COLUMBIA: PRE-LAUNCH STATUS REPORT

With seven days remaining before the liftoff of STS 52, Columbia has had a number of pre-launch tasks completed while it sits upon Launch Complex 39B. Finished work: contingency EVA spacesuit installation; Orbiter/external tank cavity purge leak checks; IRIS/LAGEOS closeouts; auxiliary power unit leak checks; main engine #3 gimbal check; carrier panel/heat shield installation; PRSD tank purges; countdown preparations and communications activation in FR #3. Work in progress: aft main engine compartment cleaning and closeout; Orbiter aft confidence test; stowage of consumables and flight crew equipment in crew cabin; firepole installation on the mid-deck; external tank purges; auxiliary power unit closeout inspections.

Scheduled work includes: cavity purge retest; loading of mass memory units; vehicle ordnance connections; IRIS/LAGEOS ordnance connections; external tank/solid rocket booster closeouts; Orbiter aft positive pressure check; removal of main engine protective covers; aft compartment final inspections; installation of Orbiter aft flight doors; USMP payload cryogenic topoff; payload bay closeouts; pad/mobile launcher platform washdown/debris walkdown; STS 52 countdown begins October 19; the payload bay doors are closed October 20. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 15, 1992.]

DISCOVERY: SIGNAL CONDITIONER FAILS

Testing indicates a power bus within a signal conditioner has failed on Discovery's left OMS Pod. There are two busses within each signal conditioner, and there are two signal conditioners on each pod. While the signal conditioner does not affect performance of the pod, it provides half of the instrumentation data available from the pod. Should the second power bus which does work fail in flight, half of the instrumentation on the pod could not be monitored, leaving flight controllers without data. The signal conditioner cannot be replaced while the pod is on the Orbiter. A final test confirming the failure is planned before a decision is made to remove the pod. However, should this course of action be adopted, a schedule impact of more than a few days is possible. Whether to replace the pod with another, or whether to remove the pod and replace the signal conditioner at the Orbiter Processing Facility, and the schedule impact of each, is under discussion should the failure be confirmed. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 15, 1992; NASA/KSC News Release No. 92-055, Oct. 14, 1992; Banke, FLORIDA TODAY, p. 2A, Oct. 16, 1992.]

NASA/CONTRACTORS CONFERENCE

The Ninth Annual NASA/Contractors Conference on Quality and Productivity will take place at the Pasadena Center (Pasadena, CA), October 20-21, 1992. The theme of this year's conference is "World Class Excellence: The Journey Continues." The event is expected to draw over 900 attendees. The conference, hosted by the Jet Propulsion Laboratory in conjunction with the California Institute of Technology, both in Pasadena, will provide a forum to discuss and exchange ideas, success stories and lessons learned in the practical application of the principles of Total Quality Management that spearhead continuous improvement witting organizational structures and processes.

NASA Headquarters Associate Administrator for Continuous Improvement Dr. **Laura Broedling** will give the opening keynote address. A highlight of the event will occur when Acting Deputy Administrator **Aaron Cohen** announces the 1992 George M. Low Trophy recipient(s), NASA's Quality and Excellence Award, at the evening banquet on October 20.

1992 Low Trophy Finalists

Cray Research, Customer Service, Engineering and Manufacturing Divisions	Chippewa Falls, Wisconsin
Honeywell, Inc., Space and Strategic Systems Operation	Clearwater, Florida
IBM Federal Systems, Co.	Houston, Texas
McDonnell Douglas Space Systems Co.	Kennedy Space Center, Florida
Paramax Systems Co.	Houston, Texas
Rocket Research, Co.	Redmond, Washington (Small Business)
Stanford Telecommunications, Inc.	Reston, Virginia
Technical Analysis, Inc.	Houston, Texas (Small Business)

The award recognizes both NASA's large and small prime contractors, subcontractors and suppliers for outstanding achievement in quality and productivity improvement and Total Quality Management (TQM). Key goals of the award are to internalize quality and productivity practices and TQM processes throughout NASA and the agency's contractors and to transfer performance improvement methods of the award recipients to others. [NASA/KSC News Release Number 92-90, Oct. 15, 1992.]

GOLDIN ANNOUNCES NASA CHANGES

"Of all the agencies in government, NASA has a unique responsibility to invest in the future to ensure there is hope and opportunity, to keep America on the cutting edge of technology," NASA Administrator **Daniel S. Goldin** said in Washington. "Today, I am announcing a series of structural changes to better focus NASA's programs, to streamline how we do business so we can meet the challenges ahead." In preparation for today's announcement, Goldin said over the past six months he has traveled to NASA's centers, visiting with hundreds of employees, worked with the Red & Blue Teams, met with CEO's

of America's top companies, met with small and disadvantaged companies, small entrepreneurial companies, and reached out into minority and women-owned companies. He has also traveled abroad to meet with leaders in space policy, met personally with almost 200 members of Congress and analyzed major reports such as the Augustine Report, the Paine Commission Report, and the Rogers Commission Report. He has also reached out to academia and the science community.

"The past six months I've reached deep into NASA to listen to the hopes and dreams of employees. I've listened to concerns expressed by America's leaders outside the agency," he said. "If there is universal agreement on one point it's that NASA cannot afford to fail, that it must be the preeminent technological leader of the world," Goldin stated. "NASA must reach for the stars and bring back to America dual-use technology to improve life on Earth." To achieve its goals, Goldin announced the following structural and managerial changes at NASA:

SPACE STATION FREEDOM: Strengthening the focus of management of Space Station Freedom (SSF) is of the highest priority to NASA. In a September 17, 1992, speech, Goldin said he was "taking steps to ensure NASA's top talent is working on this program." **Marty Kress** will become Deputy Program Manager for Policy and Management, responsible for strengthening cooperation with the space station user community, international partners, and the private sector. Kress's previous position was Assistant Administrator for Legislative Affairs. "Marty Kress is one of NASA's best and brightest young 'stars,' who has successfully helped me steer the agency through difficult budget deliberations on Capitol Hill," Goldin said. "His talent is now needed for even greater challenges, to pull together, coordinate, and integrate the scientific and commercial communities so they take full advantage of the opportunities [offered by] Space Station Freedom." Marty Kress' appointment will allow **Richard Kohrs** to focus his skills on the day-to-day development and construction of SSF. **Mary Kerwin**, Director, Liaison Division, will become Acting Assistant Administrator for Legislative Affairs. **Tom Campbell**, formerly Comptroller, will become the Chief Financial Officer for SSF to help ensure SSF keeps within its budget estimates. "Tom Campbell is recognized as the strongest financial officer at the agency," Goldin said. "He's NASA's top talent, who will be responsible for keeping a watchful eye on the budget and schedule." **Gary Allison**, who was Deputy Comptroller, will become Acting Comptroller.

SCIENCE & TECHNOLOGY: NASA, which is known for its science, must strengthen its outreach to the science community to improve the integration and coordination of research. **Lennard A. Fisk** will be promoted to the new position of Chief Scientist for NASA. Len's previous position was Associate Administrator for Space Science and Applications. "Len is one of NASA's most brilliant and outstanding scientists," Goldin said. "His formidable challenge will be to aggressively work with the scientific and engineering community to fully involve them in our research goals. He will be responsible for forging a strong bond with the directors of research and development in corporate America to ensure NASA is getting the very best technology in all our science missions," Goldin said. "Len, because of his outstanding communication abilities, will also be instrumental in explaining to the public the importance of NASA's research to improve life on Earth and inspire opportunity and hope," Goldin continued.

EARTH & PLANETARY SCIENCE: The office of Science and Space Applications will be divided into two parts to bring focus to the programs. **Shelby Tilford**, will become Acting Associate Administrator of Mission to Planet Earth. He previously was Director of Earth Sciences. "Mission to Planet Earth is more than a duty, it's a moral commitment to future

generations," Goldin said. "We must understand our environment - separating natural from human causes and effects - so policy makers can make decisions on hard data, not suppositions." **Wes Huntress**, previously Director of Solar Systems Exploration, will become Acting Associate Administrator of Planetary Science and Astrophysics. "We must build more spacecraft that are smaller, faster, and cheaper," Goldin said. "By studying our solar system and the universe, we will be able to better understand Earth's environment and its future, and see if life developed other places."

AERONAUTICS: Goldin announced in a recent speech that NASA needs a better balance of programs between subsonics, NASP hypersonics, and high speed civil transport. In addition, NASA needs to develop a strategic plan to ensure we have the proper facilities to keep America's aerospace industry the world's leader. The Office of Aerospace and Space Technology will be divided to provide focus. **Pete Peterson** will become Special Assistant to the Administrator to develop a comprehensive and integrated long-term plan that identifies the critical facilities for aeronautics and space. He had been an Associate Administrator. "As the Augustine Report points out, NASA's infrastructure is critical to meeting its mission goals," Goldin said.

"NASA must develop an integrated facilities plan, in coordination with other government agencies and private industry, to construct world class facilities for aeronautics and space. We must avoid duplication in government and industry to achieve maximum results and stretch taxpayer's dollars," he said. **Cecil Rosen**, who was Director for Aeronautics, will become Acting Associate Administrator for the Office of Aeronautics. **Gregory Reck** will become Acting Associate Administrator for the new office of Advanced Concepts & Technology. **Courtney Stadd** will become Acting Deputy Associate Administrator for the new office of Advanced Concepts & Technology. "NASA needs to attract and work with America's greatest researchers and entrepreneurs in academia and industry," Goldin said. "This office will push America's technological frontiers. It will be the catalyst for innovation and commercialization of technology, for transferring technology to create jobs and opportunity." As part of the restructuring, the Office of Commercial Programs will become part of this new division. **Jack Mannix**, who was Assistant Administrator for the Office of Commercial Programs, will become Associate General Counsel for Intellectual Property.

RUSSIAN PROGRAMS: **Samuel Keller**, Associate Administrator for Russian Programs will be on Special Assignment. "Because of Sam Keller's talent and hard work, NASA has been able to sign far-reaching contracts with Russia in record speed," Goldin said. "He now will be moving on to new and exciting challenges." [NASA/KSC News Release No. 92-172, Oct. 15, 1992; "Goldin Revamps NASA Management," FLORIDA TODAY, p. 9E, Oct. 25, 1992.]

October 16: **COLUMBIA: PRE-LAUNCH STATUS**

Technicians at Launch Complex 39B have completed an Orbiter aft confidence test and the stowage of consumables and flight crew equipment in the crew cabin of Columbia. The firepole has been installed in the mid-deck; the external tank has been purged; auxiliary power unit closeout inspections have been conducted and the contingency EVA spacesuit has been installed. Still in progress for the Shuttle's STS 52 mission: aft main engine compartment closeouts; loading of mass memory units; cavity purge retest; ordnance installation; preparations to pick up the countdown at 4 p.m. Monday (October 19). Work scheduled: vehicle ordnance connections; IRIS/LAGEOS ordnance connections; USMP cryogenic servicing; external tank/solid rocket booster closeouts; aft

compartment final inspections; installation of aft flight doors; Orbiter aft pressure check; USMP cryogenic topoff; payload bay closeouts; astronaut arrival; closing of payload bay doors on October 20; gaseous oxygen system leak check. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 16, 1992.]

DISCOVERY: STS 53 PREPARATIONS

Discovery's solid rocket boosters have been completely stacked for mating in the Vehicle Assembly Building; the external tank and SRBs have been mated and technicians have conducted an IUS/TDRS interface verification test. STS 53 mission preparations in progress include: vibration testing; nose wheel steering test; auxiliary power unit closeouts; left OMS Pod electrical troubleshooting; IUS/TDRS end-to-end communications test in the Vertical Processing Facility; aft section closeouts. Work scheduled: disconnect left hand orbital maneuvering system pod crossfeed lines; remove and inspect left hand OMS Pod; replace left hand OMS Pod. A decision has not yet been made on whether to repair and use the pod now on Discovery or to use another pod now at the Hypergolic Maintenance Facility. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 16, 1992; "Spacecraft Passes Tests," FLORIDA TODAY, p. 10E, Oct. 25, 1992.]

ATLANTIS: GETTING OUT OF TOWN

The Space Shuttle Atlantis continued in a pre-ferry flight mode at Kennedy Space Center today. The Orbiter was mounted on the Shuttle Carrier Aircraft and moved to the Shuttle Landing Facility. The mated pair were set to head for Palmdale, CA, tomorrow, barring poor weather. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 16, 1992.]

ENDEAVOUR: STS 54 PROCESSING

Endeavour, also known as OV-105, remains in Orbiter Processing Facility Bay 1 where it is being processed in anticipation of a January 1993 STS 54 launch. Work completed to date: drag chute installation; drag chute mortar installation; crew hatch functional check; OMS functional test; main engine leak checks; power reactant storage and distribution system checks; waste management system drain and flush. Work in progress: auxiliary power unit servicing; reactant system checkout; inspections of the 17 inch quick disconnect; main propulsion system leak checks; nose wheel steering checkout; brake hydraulic system testing; left booster stacking in the VAB; external tank electrical testing in the VAB; window replacement/window polishing. Installation of the support beam for Get Away Special canisters has been scheduled. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 16, 1992.]

October 19: **STS 52: COUNTDOWN STARTS TODAY**

The countdown for Columbia's 13th mission starts today at 4:00 p.m. EDT. "So far it's been a pretty quiet, smooth operation," said **George Diller**, KSC spokesman. "Unless we get some kind of surprise, this is going to follow just the way we've laid it out." Liftoff is set to occur between 11:16 a.m. and 1:46 p.m. EDT. Technicians are trying to finish their last tasks inside Columbia so the payload bay doors can be closed Tuesday morning. Atlantis finally began its cross-country ferry flight yesterday after bad weather prevented the takeoff of the Orbiter and its Shuttle Carrier Aircraft on Saturday. The Shuttle will remain in California for almost a year until it returns to the space center for its April 1994

launch. [Banke, FLORIDA TODAY, p. 1A, Oct. 19, 1992; Banke, FLORIDA TODAY, p. 1A, Oct. 18, 1992.]

COLUMBIA: STS 52 STATUS REPORT

Ordnance connections have been made for the IRIS/LAGEOS payloads aboard Columbia for its STS 52 mission. The external tank and solid rocket boosters have been closed out. Work in progress: payload closeouts; USMP cryogenic topoff; removal of IRIS/LAGEOS safe and arm pin; aft main engine compartment closeouts; cabin stowage; countdown preparations in Firing Room #3; pad/mobile launcher platform washdown/debris walkdown. Work scheduled: aft access platform removal; installation of aft flight doors; Orbiter aft pressure check; removal of payload access; closing of payload bay doors at 5:30 a.m. October 20; start of countdown at 4 p.m.; astronaut arrival at 5:30 p.m.; installation of mid-deck experiments; retraction of rotating service structure; tanking. The chance of acceptable liftoff weather on October 22 is 80%. Skies are forecast to be partly cloudy, the temperature approximately 80 degrees, and winds are expected to be NNE 10-15 knots. [SPACE SHUTTLE STATUS REPORT: STS 52, Oct. 19, 1992.]

ASTRONAUTS ARRIVE AT KSC

The six astronauts of Columbia's STS 52 mission crew arrived today at Kennedy Space Center about 5:30 p.m. "Columbia's ready to go. All of our experiments are ready to go, and our training team says that we are ready to go. I can absolutely, positively guarantee that we are ready to go fly and take one more small step in this great adventure," said Mission Specialist **Charles Lacy Veach** on his arrival at the Shuttle Landing Facility this afternoon. Forecasters continue to predict an 80% chance of favorable weather for the launch window which extends from 11:16 a.m. until 1:46 p.m. October 22. Commander **James D. Wetherbee** remarked at the arrival ceremony: "We have a pretty challenging mission ahead of us. We're looking forward to it. We have a lot of science that we're going to try to accomplish and hopefully we 'll bring a lot of data back and keep the scientists happy for a couple of years. We may end up with more questions than answers but that's the nature of the game." Mission Specialist **Tamara E. Jernigan** commented, "We're ready to go. We're ready to light 'em." The other members of the crew are Pilot **Michael A. Baker** and Mission Specialists **William M. Shepherd** and Canadian space rookie **Steven MacLean**. [Brown, FLORIDA TODAY, p. 4A, Oct. 20, 1992.]

LAUNCH CLOSES PLAYALINDA BEACH

Playalinda Beach will be reopened to visitors the day following the launch of the Space Shuttle Columbia from Launch Complex 39B on Mission STS 52. Launch is scheduled for 11:16 a.m. EDT, October 22. The beach closing is required whenever a Space Shuttle is present at LC 39B or three days prior to a launch from LC 39A. [NASA/KSC News Release No. 147-92, Oct. 19, 1992.]

IML-2 MISSION SPECIALISTS SELECTED

NASA today announced that Dr. **Chiaki Mukai**, Ph.D and M.D. of the Japanese National Space Development Agency, has been designated as the prime payload specialist for the second International Microgravity Laboratory mission (IML-2) scheduled for launch in July 1994. Dr. **Jean-Jacques Favier**, a scientist with the French Atomic Energy Commission, has been selected as an alternate payload specialist. During the mission, Dr. Favier will

be one of the principal communicators with the laboratory. As a backup payload specialist, he also will train for the payload mission so that he could substitute for a flight payload member should one be unable to fly the mission. Dr. Favier was selected by the French Space Agency as a candidate astronaut in 1985.

"The selection of Dr. Mukai and Dr. Favier to the crew of the IML-2 mission truly accents the international nature of the mission," said NASA Administrator **Daniel S. Goldin**. "I was pleased to have the honor of informing both the Japanese and the French space agencies of their selection." The first mission in the series, IML-1, flew in January 1992 on the STS 42 flight of Columbia. For IML-2, an international team consisting of 80 principal investigators from more than 13 countries will focus on materials and life sciences, two disciplines needing crew participation and access to reduced gravity. IML-2 will use the Spacelab long module and is a dedicated microgravity mission. The overall objective of the IML-2 mission is to conduct investigations in applications, science and technology that require the low-gravity environment of Earth orbit flight and a stable vehicle attitude over an extended-duration mission.

The mission plan calls for the Space Shuttle Columbia to fly in a 160 nautical mile-high, 28.5 degree orbit. Mission duration is planned for 13 days. The Orbiter will fly in a "gravity gradient" stabilized attitude (tail toward Earth), thereby producing the least gravitational disturbances on the Spacelab laboratory during the flight. As previously announced, NASA astronaut **Richard J. Hieb** will serve as Payload Commander and Mission Specialist for IML-2. Other crew members will be named in the future. The IML series is intended as an ongoing international research program in materials and life sciences in a microgravity environment. The program is managed by NASA's Office of Space Science and Applications, Washington, D.C. **Wayne Richie** is the IML-2 Program Manager, and Dr. **Robert Sokolowski**, NASA Headquarters, is the Program Scientist. The IML-2 Mission Manager is **Lanny Upton**, and the Mission Scientist is Dr. **Robert Snyder**, both from the Marshall Space Flight Center (Huntsville, AL). [NASA/KSC News Release, Oct. 19, 1992.]

TDRS-F/IUS-13 COMPLETES KEY TESTS

The Tracking and Data Relay Satellite (TDRS-F), scheduled to be launched on Shuttle mission STS 54. completed two significant tests last week while in the Vertical Processing Facility at Kennedy Space Center. On October 14-15, the spacecraft, the sixth of its kind to be launched aboard the Shuttle, successfully completed an interface verification test (IVT) between the satellite and the inertial upper stage (IUS) booster. The IVT, a 30-hour-long systems test, revealed no problems with the electrical or mechanical connections between the TDRS and the IUS. The test also confirmed the ability of the two components to communicate with each other and with the Space Shuttle vehicle. The TDRS was mated to the IUS on October 5.

Following the IVT, **Roelof Schuiling**, the TDRS Payload Manager, said, "we are continuing on schedule and found nothing that will cause us to deviate from our current timeline." Also last week, the spacecraft successfully passed the all encompassing "end-to-end" test, a network communications test designed to reveal any specific areas of concern with the satellite and its ground controlling stations. The test involved the spacecraft and the IUS booster; the IUS control facility at the Air Force Consolidated Space Test Center (Sunnyvale, CA); the TRW plant (Redondo Beach, CA), where TDRS was manufactured; the TDRS ground station (White Sands, NM); Goddard Space Flight Center (Greenbelt, MD), the primary network operations center for TDRS; Space Shuttle Mission Control at

Johnson Space Center (Houston, TX); the MILA Tracking Station (Kennedy Space Center, FL); and the TDRS Checkout Station at Hangar AO and the IUS Checkout Station (Cape Canaveral Air Force Station, FL).

The end-to-end test checked the configuration of the satellite and its controlling NASA centers, allowing for simulated control of the spacecraft in the Orbiter's payload bay and in its eventual orbit in space. The test was completed October 17 without any surprises, prompting Schuiling to reiterate that the spacecraft is in good health and work is on schedule. This week, TDRS and IUS will be powered up for additional power-on tests as preparations continue to ready the spacecraft and booster for delivery to Launch Complex 39B in mid-November. TDRS-F is scheduled to be launched aboard the Shuttle Endeavour in January 1993. [NASA/KSC News Release No. 146-92, Oct. 19, 1992.]

October 20: **STS 52: COUNTDOWN UNDERWAY**

Columbia's payload bay doors were closed for flight today at 2:25 a.m.; the aft main engine compartment was closed yesterday. Technicians have also completed an aft compartment pressure check; they have washed down the pad and conducted a debris inspection. Work in progress: firing circuit verification check (PIC resistance) and loading Orbiter fuel cell cryogenic storage tanks (PRSD). Work scheduled: Orbiter midbody umbilical (OMBU) retract tonight; activate Orbiter communications systems overnight; load main engine computer controller software overnight; install mid-deck experiments on October 21; retract rotating service structure at 11 a.m. October 21; configure cockpit switches for launch; begin fueling at 2:56 a.m. EDT October 22. The chance of acceptable liftoff weather on launch day is 70%. Clouds are forecast to be scattered, the temperature approximately 80 degrees, and winds are expected to be NE 12-18 knots. The concerns are for an RTLS crosswind violation and a slight chance of developing a low level ceiling, also an RTLS constraint. There are no technical issues or concerns for launch of the STS 52 mission. [SPACE SHUTTLE STATUS REPORT, Oct. 20, 1992.]

RATS LOADED ONTO COLUMBIA

A dozen male albino rats part of a life science experiment studying osteoporosis were loaded aboard Columbia today. Astronauts tend to lose calcium in their bones during space flights; the experiment looks to preventing calcium loss (osteoporosis) on the ground. Loading the rats is the last major pad activity tonight before clearing the pad for propellant loading. Shuttle Program Chief **Leonard S. Nicholson** said today that "we're ready to go; everything is moving right along at a smooth pace." The major concern for tomorrow's launch is high crosswinds at the Shuttle Landing Facility. Launch rules call for winds no higher than 17 miles per hour and forecasts predict winds at between 13 and 21 mph. A second attempt may be made Friday if the winds prevent tomorrow's liftoff. [Banke, FLORIDA TODAY, p. 2A, Oct. 21, 1992.]

October 21: **STS 52: PHYSICS THEORY TEST**

Scientists will test a Nobel Prize-winning theory which may have applications ranging from hurricane dynamics to superconductivity during Space Shuttle Columbia's STS 52 mission which is scheduled for launch tomorrow, October 22. The Lambda-Point Experiment (LPE), part of NASA's first United States Microgravity Payload (USMP-1), will study the strange behavior of helium at its critical temperature of 2.177 degrees above absolute zero (minus 459 degrees F). "Cryogenics and ultra-sensitive thermometry (measuring billionths of a degree) will be used to study the mysteries of changes in material

properties during phase transitions," said **Reuben Ruiz**, LPE Manager for NASA's Jet Propulsion Laboratory (Pasadena, CA). Phase transitions, such as those between water and steam or ice and water, are common in nature and technology and are well understood with certain exceptions. [NASA/KSC News Release No. 92-176, Oct. 21, 1992.]

IBM/HONEYWELL WIN LOW TROPHY

IBM Federal Systems Co. (Houston, TX) and Honeywell, Inc., Space and Strategic System Operations (Clearwater, FL) have been named recipients of the 1992 George M. Low Trophy - NASA's Quality and Excellence Award. NASA Acting Deputy Administrator **Aaron Cohen** announced the selection last night at the Ninth Annual NASA/Contractors Conference on Quality and Productivity in Pasadena, CA. "These companies have not only made the commitment to improve, but they have demonstrated the courage to be measured on their progress," said Cohen. The Low Trophy recognizes NASA's prime contractors, subcontractors and suppliers for outstanding achievements in quality and productivity improvement and Total Quality Management (TQM). Key goals of the award are to internalize quality and productivity practices and TQM processes throughout NASA and the agency's contractors.

"The success of NASA's mission is dependent on the quality of the products and services our suppliers provide. The Low Trophy recognizes firms who are truly enhancing their overall quality," said Dr. **Laura Broedling**, Associate Administrator for the Office of Continuous Improvement. IBM Federal Systems has supported every crewed space flight. Support consists of both ground and onboard hardware and software, which include command and control, communications and administrative functions. Honeywell, Inc. built the flight control systems for the Space Shuttle and also built and rebuilt the original and improved main engine controllers. Honeywell also is providing stabilization and control systems for NASA's Space Station Freedom. [For a list of finalists, see the Low Trophy story above dated October 15.] [NASA/KSC News Releases No. 92-178, Oct. 21, 1992.]

October 22: **STS 52 LAUNCH**

Columbia's STS 52 mission launched today at 1:09:39.0633 p.m. EDT after a nearly two hour delay while launch controllers waited for improved wind conditions at Kennedy Space Center. "The flagship of the fleet is back in space," radioed Commander **James D. Wetherbee** about 10 minutes after launch. Launch managers disagreed about whether to bend weather rules for the liftoff. Rules prohibit launches if winds at the space center are greater than 17 mph; higher gusts were recorded during the launch. There are three possible landing opportunities for Columbia at KSC on November 1: 7:31 a.m.; 9:05 a.m.; 10:38 a.m. EST. Which opportunity will be prime is under discussion by the Mission Management Team. [Broad, THE NEW YORK TIMES, p. A15, Oct. 23, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-6, Oct. 23, 1992; SPACE SHUTTLE STATUS REPORT, Oct. 23, 1992; SPACE SHUTTLE STATUS REPORT, Oct. 28, 1992.]

October 23: **DISCOVERY: PRE-FLIGHT PROCESSING**

Technicians in Orbiter Processing Facility Bay 3 have completed changing out the left OMS Pod of Discovery and vibration testing of the Orbiter. They have also completed the galley water tank installation. Work in progress for STS 53: left OMS Pod electrical hookups; aft compartment closeouts; nose wheel hydraulic actuator trouble shooting;

galley water supply functional testing; solid rocket booster joint leak checks in the VAB. Scheduled work: left OMS Pod electrical IVT, leak check, and functional test; nosewheel steering retest; aft compartment positive pressure check; Orbiter positive pressure check; crew module closeouts; weight and center of gravity determination. Rollover of Discovery to the VAB is targeted for November 1. While a new launch date has not yet been set, NASA managers have decided that there will not be an attempt to launch during the week of Thanksgiving. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 23, 1992.]

LAUNCH COMPLEX 39B: LITTLE DAMAGE

Preliminary inspections of pad B showed no abnormal damage to the due to the launch October 22 of Columbia's STS 52 mission. The Shuttle's Solid Rocket Boosters are due to arrive at Hangar AF this afternoon. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 23, 1992.]

ENDEAVOUR: STS 54 PROCESSING

Main propulsion leak checks of Endeavour have been completed during the Orbiter's STS 54 processing in OPF Bay 1. Also completed: auxiliary power unit hot oil flush; APU leak and functional checks; aft communications display panel changeout; postflight structural inspections; chin panel thermal protection rework; IUS/TDRS payload interface verification test (IVT) in the VPF; IUS/TDRS payload end-to-end test (ETE) in the VPF; IUS flight guidance system (RIMU) installation in the VPF. Work in progress: routine main engine changeout; vertical stabilizer inspections; crew hatch functional test; tire pressure checks; tile repair and replacement; payload bay light replacement; payload bay door bulb seal inspections. Work scheduled: window 5 and 6 replacement; potable water servicing; main engine leak checks; OMS electrical redundancy checks; Orbiter/external tank functional check; ammonia boiler servicing; Ku band antenna upper gimbal unit replacement; auxiliary power unit servicing and functional checks; flight deck data display system multifunction test; flight deck communications system retest and installation of the waste containment system. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 23, 1992.]

October 24: **WETHERBEE: LAUNCH DECISION RIGHT**

STS 52 Commander **James D. Wetherbee** said today that he agreed with Deputy Shuttle Program Director **Brewster H. Shaw Jr.**'s decision to launch Columbia October 22. "I guess I am kind of happy to leave those decisions to the folks on the ground who are well qualified to make those decisions," Wetherbee said. "I am confident that the folks had some good discussion and came to the decision they felt was right, and I'm willing to carry on with whatever decision that they come to. I'm sure the appropriate discussions went on and I'm very happy with the outcome." He went on to say: "There are many risks involved with the Space Shuttle program. We will never launch this vehicle without assuming some risk. We do manage that risk the best way we can. I think we do a very good job of managing that risk and minimizing that risk and I think, by the way, the science is worth going after." LAGEOS-2 was deployed at 9:57 a.m. yesterday. IRIS upper stage and LAGEOS apogee kick motor performance was nominal. [Halvorson, FLORIDA TODAY, p. 3A, Oct. 25, 1992; SPACE SHUTTLE STATUS SUMMARY, Oct. 23, 1992.]

October 26: **COMPUTER FIRMS SELECTED**

NASA's Goddard Space Flight Center (Greenbelt, MD), has selected eight firms for negotiations leading to the award of nine separate Indefinite Delivery/Indefinite Quantity (ID/IQ), firm-fixed price contracts for seven classes of work stations and two categories of supporting equipment that comprise the Scientific and Engineering Work Station Procurement (SEWP). The SEWP is an open systems procurement based on government and industry standards. The nine ID/IQ contracts will have a potential value of approximately $800 million over a 1-year basic contract period plus four 1-year options, according to Goddard officials. The firms and the classes and categories for which they have been selected are:

* **Class 1:** **Federal Computer Aided Engineering/Computer Aided Design Work Stations - SUN Microsystems (Mountain View, CA)**
* **Class 2:** **CAE/CAD Mechanical Design Work Stations - Hewlett-Packard (Rockville, MD**
* **Class 3:** **Missions Operations Work Stations - Harris Computer Systems (Ft. Lauderdale, FL)**
* **Class 4:** **Network Data Server Work Stations - IBM (Bethesda, MD)**
* **Class 5:** **High Performance 3-D Graphics Work Stations - Silicon Graphics Inc. (Bethesda, MD)**
* **Class 6:** **Multi-Purpose Computer Server Work Stations - Silicon Graphics, Inc.**
* **Class 7:** **General Purpose Work Stations - Digital Equipment Corp. (Lanham, MD)**
* **Class 8:** **X-Terminals/Printers Category - GTSI (Chantilly, VA)**
* **Class 9:** **Network Equipment Category - Paramax Systems Corp. (Reston, VA)**

This effort provides for all NASA and NASA-funded sites, the procurement of leading-edge, state-of-the-art computer work Stations at the lowest cost for both the scientific and engineering arenas. The contracts will also provide for the delivery, installation and maintenance of the equipment as well as the ability to expand the capabilities of the Work Stations by allowing the end-user to order from a sizable list of growth options. In addition, 10 percent of the total value of the requirement will be reserved for use by other government officials.

A further feature of this procurement is the development and maintenance of a unique test-site/trouble-shooting support group known as the "SEWP Bowl." The SEWP Bowl will be staffed by the government to manage the nine resultant contracts and to provide administrative and technical support for the end-users. Thirty day operational capability demonstrations for each class and category are expected to begin shortly. The nine contracts are expected to be awarded in December 1992. [NASA/KSC Release No. 92-183, Oct. 26, 1992; Smith, Government Computer News, pp. 3 & 73, Nov. 9, 1992.]

October 27: **STS 53: TESTS COMPLETED**

In OPF Bay 3, technicians have completed a number of checks and tests upon Discovery prior to its STS 53 mission in November. Work completed: left OMS Pod functional test; left OMS Pod structural leak check and electrical checks; galley functional test. Work in progress: left OMS Pod closeouts; aft main engine compartment closeouts; nose wheel steering hydraulic trouble shooting; thermal protection system closeouts; crew module closeouts. Work scheduled: aft compartment positive pressure check; Orbiter positive pressure check; nose wheel steering retest; weight and center of gravity determination;

the VAB set for Sunday (November 1). [SPACE SHUTTLE STATUS REPORT, 992.]

STS 65 MISSION SPECIALISTS NAMED

ao, Ph.D,, and **Donald A. Thomas**, Ph.D., are assigned as Mission Specialists rnational Microgravity Laboratory-2, Space Shuttle Mission STS 65, scheduled 994. "Both Don and Leroy bring strong materials science backgrounds to the load crew. Their strengths will complement the previously assigned crew in achieving the multi-science objectives of this important international mission," g Director of Flight Crew Operations **Steven A. Hawley**. Other crew members named to this microgravity mission are Payload Commander **Richard J. Hieb** d **Mukai**, Ph.D. and M.D., a Payload Specialist from the National Space ent Agency of Japan.

holds a Ph.D. degree in chemical engineering from the University of California. lwaukee, WS, he was selected by NASA in 1990. He has worked on Space ght software verification in the Shuttle Avionics Integration Laboratory and working crew equipment issues in the Mission Development Branch of the Office. Thomas, 42, has a doctorate degree in materials science from Cornell His dissertation involved evaluating the effect of crystalline defects and sample e superconducting properties of niobium. He was born in Cleveland and, like member of the 1990 astronaut class. He has worked on issues relating to the biter systems in the Safety and Operations Development Branches of the Office. He currently is serving as CAPCOM, an astronaut in the Mission Control o communicates with the Space Shuttle crew members during a mission. News Release No. 92-187, Oct. 27, 1992; "NASA Assigns 2 to Flight," p. 9E, 2.]

DISCOVERY: OMS WORK COMPLETED

left orbital maneuvering system pod has been functionally tested and has electrical checks while STS 53 pre-flight processing continues in OPF Bay 3. gress: left OMS Pod leak check; aft main engine compartment closeouts; aft compartment positive pressure check; nose wheel steering hydraulic trouble heel well inspections; thermal protection system closeouts. Work scheduled: tive pressure check; nose wheel steering retest; cockpit CRT #1 removal and t; weight and center of gravity determination; rollover to the VAB Sunday 1). [SPACE SHUTTLE STATUS REPORT, Oct. 28, 1992.]

STS 53: MAY GO DECEMBER 2

ls said today that Discovery's STS 53 mission may commence December 2; s duration is seven days and is for the Department of Defense. A problem Discovery's Orbital Maneuvering System Pods has brought about an 18-day minal countdown demonstration test will run from November 11 through 12. crew includes: Commander **David M. Walker**, Pilot **Robert D. Cabana** and cialists **Guion S. Bluford, Michael R. U. Clifford** and **James S. Voss**. The firm will be set following November 18's flight readiness review. [Halvorson, DAY, p. 2A, Oct. 29, 1992.]

October 29: **DISCOVERY: COCKPIT CRT REPLACED**

During its pre-STS 53 processing in OPF Bay 3, Discovery has had its cockpit CRT #1 removed and replaced. Technicians have completed nose wheel troubleshooting and retesting and a left OMS Pod structural leak check. Work in progress: left OMS Pod closeout; Orbiter positive pressure check; aft main engine compartment leak checks and closeouts; topping off tire pressures; thermal protection system (tiles) closeouts and a retest of the cockpit CRT #1. Work scheduled: crew compartment closeouts; weight and center of gravity determination; installation on Orbiter transporter; rollover to the VAB; mating to external tank/solid rocket boosters; rollout to Launch Complex 39A on November 6. [SPACE SHUTTLE STATUS REPORT, Oct. 29, 1992.]

STS 52: COLUMBIA LANDING OPPORTUNITIES

There are three possible landing opportunities for Columbia at Kennedy Space Center on November 1 (Sunday) which are 7:31, 9:05, 10:38 a.m. EST. Which opportunity will be prime has not been finally determined by the Mission Management Team. The weather forecast calls for scattered low and high clouds, with a slight chance for fog or rainshowers within 30 nautical miles. Monday's forecast is similar, but with a reduced chance for fog, and a slightly greater chance for rainshowers within 30 nautical miles. Weather at Dryden is good on both Sunday and Monday. [SPACE SHUTTLE STATUS REPORT, Oct. 29, 1992.]

FREEDOM'S "EXPRESS PROGRAM"

A common complaint by space scientists is that it takes too long to conduct an experiment in space and get the data back. A new effort by the Space Station Freedom program has been initiated to dramatically reduce the time it would take to integrate small experiments on the Space Station Freedom. "It's called EXPRESS, for Expedited Processing of Experiments to Space Station," says **Robert Moorehead**, Deputy Director of Space Station Freedom. "We established the EXPRESS project because we are committed to developing a user-friendly Space Station through the small payloads program which will support innovative scientific, technological and commercial research through a streamlined payload integration process," Moorehead said.

Currently, it can take up to 5 years to get an experiment integrated on a Shuttle or Spacelab mission. "We hope we can cut the time it takes to get a small payload flown aboard Freedom to less than a year," says **Mark Uhran**, Manager of the EXPRESS Payload Project. "Freedom's three laboratories contain more than 40 refrigerator-sized experiment racks. These racks supply the experiments with electricity, cooling, data lines and other services," says Uhran. "They are called the International Standard Payload Racks because the services are identical in the United States, European and Japanese modules." [NASA/KSC Press Release No. 92-191, Oct. 29, 1992.]

October 30: **SLS-2 PAYLOAD SPECIALIST NAMED**

NASA today announced the selection of Dr. **Martin J. Fettman**, D.V.M., as the prime Payload Specialist for the second Spacelab Life Sciences mission (SLS-2) scheduled for launch in August 1993. "NASA's series of SLS missions play a central role in our program of space biomedical research," said Dr. **Lennard A. Fisk**, Associate Administrator for the Office of Space Science and Applications. "The experiments that Dr. Fettman and his

fellow SLS-2 crew members conduct will give us valuable information on how living and working in space affects the human body."

Fettman, a professor in the Department of Pathology in Colorado State University's College of Veterinary Medicine, will join the previously names STS 58 crew consisting of Commander **John E. Blaha** (Col., USAF), Pilot **Richard A. Searfoss** (Maj., USAF), Payload Commander **Margaret Rhea Seddon** (M.D.), and Mission Specialists **William S. McArthur, Jr.** (Lt. Col. USA), **Shannon W. Lucid** (Ph.D) and **David A. Wolf** (M.D.) [NASA/KSC News Release No. 92-190, Oct. 30, 1992.]

STS 53: DISCOVERY'S PRE-ROLLOVER PREPARATIONS

In OPF Bay 3, technicians preparing Discovery for its December 2 STS 53 mission have completed an Orbiter composite pressure check; they have also closed out the left OMS Pod and the aft main engine compartment. Tire pressure checks and topoff have also been completed. Work in progress: aft main engine compartment leak check; crew compartment closeouts; thermal protection system closeouts; nose wheel steering troubleshooting. During a retest of the nose wheel steering system yesterday an intermittent erratic control anomaly reappeared. Contingency time will be used to allow further troubleshooting. Work scheduled: nose wheel steering retest; weight and center of gravity determination; installation of the Orbiter on the transporter; rollover to the VAB no earlier than November 2. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 30, 1992.]

ENDEAVOUR: OPF BAY 1, PROCESSING CONTINUES

Endeavour's waste containment system has been installed in the Orbiter; other completed processing tasks include: routine main engine changeout; main propulsion system leak check; crew hatch functional test; payload bay flood light replacement; APU hot oil flush; IUS ordnance installation in the VPF. STS 54 work in progress: post installation main engine leak and electrical checks; water spray boiler servicing; potable water servicing; auxiliary power unit lube oil servicing; OMS/RCS electrical redundancy checks; TDRS Ku band antenna upper gimbal removal and replacement; air-to-ground communications uplink checkout; tile maintenance and water proofing; chin panel area rework; vertical stabilizer structural bolt changeouts; bulb seal repair; removal of windows 5 & 6 for seal replacement; reinstallation of window #7; closeouts of SRB joints and nosecones in the Vehicle Assembly Building. Work scheduled: heat shield and carrier panel installation; leak check of the external tank/Orbiter quick disconnect; external tank/Orbiter door functional check; auxiliary power unit leak and functional checks; payload bay door #3 radiator repair; payload bay door radiator cleaning; waste containment system functional check; installation of drag chute door; beginning of Orbital midbody closeouts; IUS airborne support equipment interface verification test; DXS payload installation; crew equipment interface test (CEIT). [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 30, 1992.]

SILT STORAGE SITE LOCATED ON NASA PROPERTY

NASA and the Florida Inland Navigation District (FIND) have agreed tentatively to dispose of river sediment on KSC property. The silt was produced by dredging the Indian River ship channel in North Brevard County. Merritt Island National Wildlife Refuge Manager **Ron Hight** said that FIND "just kept asking until they asked the right question. The site now being considered has already been dug up and disturbed." The site had been used

by NASA for years to provide fill for KSC construction projects. NASA will allow FIND to use the site and FIND will pay for wetland restoration. [Fiorini, FLORIDA TODAY, p. 1B, Oct. 31, 1992.]

AMF TO OPEN EDUCATION CENTER

James DeSantis, new President of the Astronauts Memorial Foundation, announced today that groundbreaking will occur December 11 for the Center for Space Education. "It will serve as the new home for NASA's enormously successful education programs," he said. NASA Deputy Administrator **Charles F. Bolden** made the keynote speech at a ceremony honoring outgoing AMF President **Alan Helman**. He remarked that the center would teach youngsters that "all science and math make sense." Bolden has recently been reactivated as an astronaut and will be commanding the first flight of Atlantis when it returns from California; the mission is tentatively scheduled for June 1994. ["Astronauts Foundation to Open Education Center," FLORIDA TODAY, p. 2B, Oct. 31, 1992.]

FOG FORECAST CLOUDS LANDING PROSPECTS

The 7:31 a.m. EST landing opportunity for Columbia's STS 52 mission has tentatively been ruled out because of fog in November 1's weather forecast. The two remaining opportunities are 9:05 and 10;38 a.m. EST, with the 9:05 time tentatively selected as prime. If neither opportunity is achieved, a landing will be retargeted for KSC on November 2. [Date, THE ORLANDO SENTINEL, Nov. 1, 1992; SPACE SHUTTLE WEEKLY STATUS SUMMARY, Oct. 30, 1992; "Shuttle Heads Home Sunday," FLORIDA TODAY, p. 1A, Oct. 31, 1992; Halvorson, FLORIDA TODAY, p. 1A, Nov. 1, 1992.]

EG&G: POSSIBLE LAYOFFS

Base Operations Contract employees of EG&G Florida today received notification that they would be "technically laid-off" if the company does not win the BOC recompetition. EG&G spokeswoman **Judy Casper** said that, in all likelihood, most of the incumbents would be picked up by the winner of the contract; only top managers would lose their jobs. ["EG&G Notifies of Possible Layoffs," FLORIDA TODAY, p. 20C, Oct. 30, 1992; Burnett, THE ORLANDO SENTINEL, pp. D-1 & D-4, Oct. 30, 1992; See also: "Lockheed Wins Base Operations Contract," Nov. 18 citation.]

NOVEMBER

November 1: STS 52 LANDS SAFELY AT KSC

The Orbiter Columbia landed at the Kennedy Space Center this morning successfully ending a ten-day flight. After completing 159 orbits, the Orbiter touched down on KSC Runway 33 at 8:05:53 a.m. CST. That equates to a Mission Elapsed Time of 9/20:56:13. Drag chute deploy came at 8:06:07 a.m. CST. Wheel stop was at 8:06:53 a.m. Cst in a Mission Elapsed Time of 9/20:57:14. NASA's official record keeping designates end of mission as the time of main gear touchdown, so the official mission elapsed time for the STS 52 was 9 days, 20 hours, 56 minutes and 13 seconds. The Columbia traveled 4,129,028 statute miles during the STS 52 flight, which was the 51st mission of the Shuttle Program. The Orbiter's of NASA's Shuttle fleet have now traveled in excess of 120 million miles in space.

Kennedy Space Center Director **Robert L. Crippen** said, "This flight was chock full of work. That crew spent 10 days on orbit delivering satellites and performing science. They worked very hard at it. It was a superb mission as far as I'm concerned." Columbia will be moved from the runway to the Orbiter Processing Facility later this evening to begin processing for its next flight scheduled for February to conduct work in the Spacelab module in support of the German Spacelab D-2 mission. [Date, THE ORLANDO SENTINEL, pp. A-1 & A-5, Nov. 2, 1992; STS-52 LANDING STATUS REPORT, Nov. 1, 1992; Brown, Banke, Halvorson, FLORIDA TODAY, p. 1A-2A, Nov. 2, 1992; "Home Again," USA TODAY, p. 12A, Nov. 2, 1992.]

November 2: DISCOVERY: STS 53 PREPARATIONS

Technicians in OPF Bay 3 have completed closeouts of Discovery's aft section and have conducted an Orbiter positive pressure test. Weight and center of gravity checks and crew compartment closeout have also been completed. Thermal protection system closeouts are in progress and preparations are underway for moving Discovery from its OPF bay to the Vehicle Assembly Building. Work scheduled: rollover to the VAB at approximately 5 a.m. November 3; mating with tank and boosters and all checkouts between November 3 and 7; rollout to Launch Complex 39A on November 8. [SPACE SHUTTLE STATUS REPORT, Nov. 2, 1992.]

NASA BOOSTS FLORIDA ECONOMY

Space related employment and contracts at NASA's Kennedy Space Center yielded a $1.587 billion growth to Florida's economy during the 1992 Fiscal Year which ended September 30. This represents an increase of about $69 million over the previous year. Of KSC's expenditures, $1.238 billion went to contractors operating on-site at the space center. An additional $80 million went to off-site businesses in Brevard County. Other purchases and contracts awarded to Florida businesses outside of Brevard County totaled about $43.3 million. Space center purchases and contracts to businesses out of state totaled about $68 million. Civil service salaries and personnel benefits through the end of FY92 amounted to $152 million, an increase of about $10 million over last year. About $125 million was for regular salary, lump-sum payments, overtime and awards programs. The remaining $27 million went for additional personnel benefits. (The $27 million civil service benefits package and $68 million in out of state business awards increased KSC's total spending during the year to $1.582 billion.) It is estimated that

approximately 92 percent of KSC's total spending, in the form of payrolls and purchase, remained in Brevard County.

Permanent federal employees at KSC totaled 2,676 during the same period. While 3,725 people were employed through construction and tenant jobs at KSC, the majority of the workers were employed by on-site contractors and numbered almost 12,300. Overall, approximately 18,700 workers were employed at KSC through the close of the Fiscal Year on September 30. Major contractors at KSC include Lockheed Space Operations Co., the Shuttle Processing Contractor; EG&G Florida Inc., the Base Operations Contractor; McDonnell Douglas Space Systems Col, the Payload Ground Operations Contractor; and Rockwell International Corp., the Shuttle Orbiter logistics support contractor. [NASA/KSC News Release No. 149-92, November 2, 1992; Banke, FLORIDA TODAY, p. 1A, Nov. 10, 1992.]

[] **COLUMBIA LITTLE DAMAGED**

Columbia's brakes were undamaged by its November 1 landing at KSC and its tires incurred only minor scuffing during the touchdown and roll to a stop. Of the 27,000 tiles which make up the Orbiter's thermal protection system, only about 110 had even minor damage. One of these will be replaced and another 65 will be removed for routine maintenance. "She's a beast on the ground, but boy when she gets in the air she just Cadillacs right along. She really did a great job," said Columbia's Processing Manager **Bascom Murrah**. NASA's Flight Director who was in charge of the re-entry and landing, **Jeff Bantle**, said, "Any landing that does no damage to the vehicle is a good landing." [Date, THE ORLANDO SENTINEL, Nov. 3, 1992; Halvorson , FLORIDA TODAY, p. 2A, Nov.3, 1992.]

November 3: **DISCOVERY ROLLS OVER TO VAB**

Discovery began its journey to Launch Complex 39A by being mated to the Orbiter transporter and rolling over from OPF Bay 3 to the Vehicle Assembly Building; the first motion was at 8:15 a.m. Once in the VAB, the Orbiter was mated to its external tank and solid rocket boosters. The Orbiter lifting sling was also attached. Work scheduled: establishing electrical connections tomorrow; beginning the Shuttle interface test on November 5. Rollout to LC 39A is set for November 8 at 12:30 a.m. The terminal countdown demonstration test is set for November 12-13. [SPACE SHUTTLE STATUS REPORT, Nov. 3, 1992.]

November 3: **GOLDIN FILLS TOP NASA POSITIONS**

NASA Administrator **Daniel S. Goldin** today announced the appointment of Dr. **Charles Pellerin** as Associate Deputy Administrator for Strategic Planning, **John R. Dailey** as Associate Deputy Administrator and **Ralph C. Thomas** as Assistant Administrator for Small and Disadvantaged Business Utilization. Dailey and Thomas were selected after a nation-wide search and review. Charles Pellerin, a 25-year NASA employee, was most recently Deputy Associate Administrator for Safety and Mission Quality. "Dr. Pellerin has a broad knowledge of L and will be responsible for creating a strategic plan to implement the agency's vision, mission and values," Goldin said. "He also will direct and oversee key elements of the strategic plan."

John R. Dailey will plan, direct and manage the institutional operations required to accomplish NASA's roles and missions. He comes to NASA from the Marine Corps,

having retired in September 1992, from the position of Assistant Commandant. "Jack Dailey brings a remarkable background in system acquisition, strategic planning, total quality management and experience in the operation of government at its higher levels," Goldin said. Thomas, formerly the Executive Director of the National Association of Minority Contractors, will become the first Assistant Administrator for Small and Disadvantaged Business Utilization. "Ralph Thomas will spearhead a determined effort to see that small and minority-owned businesses play a significant role in America's civil space and aeronautics programs," Goldin said. [NASA/KSC News Release No. 92-194, Nov. 3, 1992.]

November 4: **DISCOVERY HARD MATED TO TANK/BOOSTERS**

Discovery, now in High Bay 3 of the Vehicle Assembly Building, has been hard mated to its external tank and twin solid rocket boosters. The assembled Shuttle stack was rolled over to the transfer aisle in the VAB at 8:15 a.m. yesterday. Work in progress for STS 53: removal of the lifting sling; establishment of the electrical connections between Discovery and the stack; preparations for the Shuttle interface test (SIT). Work scheduled: the mechanical and electrical portions of the Shuttle interface test will occur on November 5 and 6, respectively; removal of the access platforms and positioning of the crawler transporter; rollout to Launch Complex 39A is set for November 8 at 12:01 a.m. "Assuming we do rollout on Sunday [November 8], that would make possible achieving a launch during the first week of December," said Kennedy Space Center spokesman George Diller today. The terminal countdown demonstration test for STS 53 remains scheduled for November 12-13. Workers are readying the external tank/solid rocket booster stack for Endeavour's next mission at the beginning of the new year; the Orbiter's payload - a communications satellite - is being delivered to Launch Complex 39B on November 9, Diller said. [Space Shuttle Status Report, Nov. 4, 1992; Banke, FLORIDA TODAY, p. 8A, Nov. 5, 1992.]

November 5: **STS 53: LIFTING SLING REMOVED**

In the Vehicle Assembly Building, workers have removed Discovery's lifting sling and completed the mechanical and electrical mating of the Orbiter with its stack. Tail service mast connections to Discovery have also been made. The mechanical portion of the Shuttle interface test is underway today in the VAB. Work scheduled: the electrical portion of the Shuttle interface test; removing the access platforms and positioning the crawler prior to rollout; rolling out Discovery on November 8; TCDT on November 12 and 13 and a flight readiness review on November 19. [SPACE SHUTTLE STATUS REPORT, Nov. 5, 1992; Banke, FLORIDA TODAY, p. 4A, Nov. 6, 1992.]

STS 54 PAYLOAD AND EXTERNAL TANK

In VAB High Bay 1 today, the STS 54 external tank is being mated to the solid rocket boosters. In the Vertical Processing Facility today, the STS 54 payload (TDRS-F/IUS-13) is being installed into the payload canister in preparation for transportation to Launch Complex 39B on November 9. In OPF Bay 1 this weekend, Endeavour's crew equipment interface test (CEIT) with the STS 54 flight crew on hand is scheduled. [SPACE SHUTTLE STATUS REPORT, Nov. 5, 1992.]

[] KSC SPONSORS THIRD BREVARD BUSINESS EXPO

About 200 exhibitors representing small businesses, government agencies, prime contractors and large corporations will be accessible to the public on November 10 at the KSC Business Opportunities Expo '92, from 9:00 a.m. to 3 p.m. at Cruise Terminal 5, Port Canaveral. Cosponsored by KSC's Small and Small Disadvantaged Business Council and the Canaveral Port Authority, this trade fair is an opportunity to match buyers, contract specialists, engineers and technical representatives with businesses. Most of the exhibitors will be from small businesses.

"One of the objectives of the KSC Council is to establish closer relationships between NASA, prime contractors and the business community. The expo is one tool for accomplishing that objective," said **Ann Watson**, Chief, Industry Assistance and Acquisition Management Staff, Procurement Office. "This is KSC's third annual expo which has gotten bigger and better each year," she added. Representatives from government agencies and prime contractors will provide counseling services to members of industry seeking potential markets for their supplies and/or services. In addition, they will provide information on future acquisition opportunities. [NASA/KSC News Release No. 151-92, Nov. 5, 1992; Randall, FLORIDA TODAY, p. 20C, Nov. 10, 1992; NASA/KSC Release No. 153-92, Nov. 1992.]

November 6: DISCOVERY MATING COMPLETED

In the VAB 's high bay 3, Discovery has been mated with its external tank and solid rocket boosters in preparation for its STS 53 mission; rollout to Launch Complex 39A is set to occur November 8. Discovery is expected to be hard down at the pad by 2:45 p.m. Today, however, Discovery is undergoing the electrical part of its Shuttle interface test. Scheduled for next week: rollout; auxiliary power unit hot firing early November 9 and commencement of inertial measurement unit calibration; main engine flight readiness test on November 10; helium signature test November 11 and the terminal countdown demonstration test on November 12 and 13. [Space Shuttle Weekly Status Summary, Nov. 6, 1992; Banke, FLORIDA TODAY, p. 5A, Nov. 7, 1992.]

[] ENDEAVOUR: IN OPF BAY 1

The TDRS/IUS payload is being installed in the transport canister in the Vertical Processing Facility in preparation for the STS 54 mission. Endeavour, in OPF Bay 1, has had Orbiter window #6 removed and replaced. L3A and L5D (two reaction control system thrusters) have been replaced. Technicians are conducting OMS/RCS flight control system checkouts and OMS Pod redundancy checks. Other completed tasks include: auxiliary power unit water servicing; auxiliary power unit leak and functional checks; potable water servicing; waste containment system installation; star tracker door functional test. Work in progress: drag chute door installation; bulb seal repair; midbody closeouts; heat shield installation; torque readjustment of vertical stabilizer bolts; auxiliary power unit leak and functional checks; tile water proofing. Scheduled work: crew equipment interface test (CEIT) for November 7; ammonia boiler servicing November 8; waste containment system checkout and functional test; payload airborne support equipment interface verification test; changeout of reaction control system (L3A) thruster bellows; payload bay cleaning commences; move of TDRS/IUS payload to Launch Complex 39B November 9; installation of DXS payload in the Orbiter's payload bay on November 10. [Space Shuttle Weekly Status Summary, Nov. 6, 1992.]

COLUMBIA: STS 55 PROCESSING

Columbia is being processed now (OPF Bay 2) for its late February 1993 STS 55 mission. Completed work: Orbiter initial post flight safing; Orbiter jack and level; establishment of Orbiter access; attachment of payload bay door strongback; opening of payload bay doors. STS 55 work in progress: post flight Orbiter inspections; main engine inspections; window inspections and polishing; cleaning and inspection of the star tracker; removal of USMP payload from the payload bay; Ku band antenna testing; Spacelab D-2 mission sequence test in the O & C building; auxiliary power unit lube oil deservicing. Scheduled work: hypergolic deservicing; forward reaction control system removal; removal of main engine heat shields; removal of waste containment system; removal of wheels and tires. [Space Shuttle Weekly Status Summary, Nov. 6, 1992.]

SATELLITE RESCUE ABILITY/COVERT GROUP

A task group, looking into issues concerning future satellite rescue and repair, says NASA should continue to perform such missions, but only when they "produce genuine benefits to U.S. interests in view of the inherent risks to the Shuttle and its crew." Task force Chairman Dr. **Eugene E. Covert** said, "The unique ability to accomplish satellite rescue and repair should not be forfeited, but these missions pose inherent risks to the Shuttle and should be undertaken only when the benefits outweigh the risks." Covert added the authority to employ this capability should rest solely with the NASA Administrator. The NASA Advisory Council Group Task Force was established at the direction of NASA Administrator **Daniel S. Goldin**. Chairman Covert is a professor of Aeronautics and Astronautics at **Massachusetts** Institute of Technology. Vice Chairman was former astronaut **Lt. Gen. Thomas Stafford**, USAF (ret). The charter of the group was to recommend "a policy outlining the criteria, the design standards and the pricing model to guide NASA in assessing the responsibilities for government and non-government satellite rescue and repair missions." [NASA/KSC News Release No. 92-197, Nov. 6, 1992.]

CAUSES OF TSS MALFUNCTIONS

The report of NASA's Tethered Satellite System Investigative Board was released today, presenting the panel's findings on problems which prevented full deployment of the satellite during Space Shuttle mission STS 46. The 47-page report examined five problems that occurred during the deployment effort and identified causes for four of them. It made recommendations for actions to be taken to prevent similar occurrences in the future. The board said the two snags during deployment and retrieval - when first releasing the satellite from the deployer and when the satellite was at 735 feet -were due to slack which developed in the tether at a point where it moves between one pulley and another - somewhat similar to movie film misfeeding in a projector. "The crew found a way to procedurally get around this slack problem," said Board Chairman **Darrell Branscome**. "In both cases the jamming was overcome. By itself, this problem would not have prevented us from fully deploying the satellite."

NASA previously had reported on August 28 that the cause of the unplanned stops at 587 and 840 feet was a mechanical obstruction - a protruding bolt - which prevented part of the tether real mechanism from moving across its full range of travel. "We contacted the bolt when the satellite was out at 587 feet," said Branscome. "What we learned from our ground simulations was that in spite of the bolt obstruction, it was possible to pull additional tether off the reel, out to 840 feet." According to the report, the bolt was part

of a hardware change made late in the review process and should have been caught in the systems engineering review. "The board made some excellent recommendations in the report on how to deal with things like late changes to the hardware," said **Jeremiah W. Pearson III**. "We are going to look carefully at their recommendations and apply the lessons learned from this flight to future missions." No plausible scenario has been validated by post-flight demonstration regarding difficulty in retracting one of two umbilicals between the tethered satellite and deployer. Based on its findings, the board recommend several specific hardware assessments and modifications which should be made to other elements of the tethered system if NASA decides to refly it. The board was formed on August 12 by **Pearson**, NASA Associate Administrator for Space Flight. The six-member board included representatives from various NASA centers and the Italian Space Agency. [Date, THE ORLANDO SENTINEL, Nov. 7, 1992; NASA/KSC News Release No. 92-196, Nov. 6, 1992; Banke, FLORIDA TODAY, p. 5A, Nov. 7, 1992.]

DELTA LAUNCH SCRUBBED

An apparent valve failure kept a Delta rocket's main engine and nine solid rocket boosters from igniting and launching on an Air Force mission. The rocket remained bolted to the pad. "The flash you saw from the vehicle was what appears to be the vernier engine start. There was no main engine start and no ignition signal sent to the solids," said Air Force Maj. **Garian Perugini**, Director of Public Affairs, 45th Space wing. The cause of the failure was not immediately known, but a similar failure occurred on May 24, 1989, and, in that instance, the failure was traced to a valve that had not opened when the countdown reached zero. The mission had not been rescheduled as of November 8. [Date, THE ORLANDO SENTINEL, Nov. 7, 1992; Halvorson, FLORIDA TODAY, p. 5A, Nov. 7, 1992; Halvorson, FLORIDA TODAY, p. 4A, Nov. 8, 1992.]

November 8: **DISCOVERY ROLLS TO LC 39A**

Discovery made a start, then stop, then start again rollout to Launch Complex 39A this morning. Shortly after beginning its rollout from the VAB at 7:20 a.m., the transporter had to be stopped. "We had to stop just outside the barn [VAB] because we had a steering problem we had to fix [on the Shuttle transporter]," said **Dick Young**, KSC spokesman. "It was no big deal." Following repairs, the transporter moved again at 9:20 a.m. Arrival and hard down at the pad came at 1:07 p.m., according to Young. Tentative launch date for Discovery's five member crew is December 2. [Halvorson, FLORIDA TODAY, p. 1A, Nov. 9, 1992; Halvorson, FLORIDA TODAY, p. 1A, Nov. 8, 1992.]

November 9: **DISCOVERY: RSS CLOSED**

At Launch Complex 39A the rotating service structure is closed around Discovery which awaits its payload and the start of its STS 53 mission. The Orbiter has been powered up; it achieved hard down status November 8 at 1:07 p.m. Work in progress today: launch pad validations; inertial measurement unit (IMU) calibrations; X-rays of reaction control system bellows; solid rocket booster flight readiness test. Work scheduled: main engine flight readiness test November 10; STS 53 astronaut arrival at the Shuttle Landing Facility tomorrow to take part in the terminal countdown demonstration test scheduled for November 12 and 13. A helium signature leak test will be conducted on November 11 and an auxiliary power unit hot firing will occur this weekend. The IUS/TDRS payload left the Vertical Processing Facility last night as scheduled but is currently in the Vehicle Assembly Building awaiting improved weather conditions before continuing on to Launch Complex 39B. [SPACE SHUTTLE STATUS REPORT, Nov. 9, 1992.]

November 10: OPEN HOUSE SET FOR NOV. 21

In celebration of the International Space Year, KSC is hosting an open house for all of its employees and their families on Nov. 21. The feature attraction is expected to be the Space Shuttle Endeavour, which is scheduled to be rolled from the Orbiter Processing Facility to the Vehicle Assembly Building transfer aisle where it will be on display. Thousands of KSC employees and family members are expected to visit Kennedy Space Center and view Endeavour. They will also be permitted to drive around Shuttle Launch Complex 39B, visit the Launch Control Center, the Shuttle Landing Facility, the Thermal Protection System Facility, the Solid Rocket Booster Assembly and Refurbishment Facility and the NASA News Center. Also open to visitors will be a solid rocket booster recovery ship to be located at the turn basin adjacent to the News Center. [NASA/KSC Release No. 153-92, Nov. 1992; Banke, FLORIDA TODAY, p. 2A, Nov. 21, 1992; Banke, FLORIDA TODAY, p. 2A, Nov. 22, 1992.]

1993 PAYLOAD PROCESSING

Even though there is one more Shuttle launch in 1992, next year's buffet of American and international payloads to be launched aboard the Space Shuttle are in various stages of preparation at KSC. Some are first-time flyers and others will be continuing a program of flights aboard the Orbiter as NASA's international partners in space. These include the second German Spacelab module to fly on the Shuttle; the ATLAS-2, a pallet and igloo of experiments; and the second Space Life Sciences spacelab module. In addition, the first Spacehab payload to be flown aboard the Shuttle will arrive at KSC in January, 1993. [NASA/KSC Release No. 153-92, Nov. 1992.]

KSC DEVELOPS NEW PROTECTIVE COATINGS

KSC is spearheading the industry in developing a revolutionary protective coating to safeguard metals such as steel and aluminum and which could have unlimited possibilities in the private sector. These coatings will be used on the Shuttle launching pads and various support equipment to guard against the corrosive effects of launch and the seaside environment. This primer coating could have applications for off-shore oil rigs, automobile parts, underground tanks, bridges and aerospace structures. Several leading coating industries have recently bid on a contract to develop the highly sought-after commercial product. [NASA/KSC Release No. 153-92, Nov. 1992.]

FLORIDA ECONOMY LIFTED BY SHUTTLE

NASA spent $1.48 billion in the 1992 budget year on launching Shuttles. "The numbers reinforce what an important cornerstone that facility [KSC] is to Brevard and to the entire region. We always look forward to the release of those figures," said Brevard Economic Development Corp. President Larry Wuensch.

NEW FREON RECOVERY SYSTEM

KSC is working with a new recovery system used to capture unused freon from Space Shuttles following their mission and return to Kennedy Space Center. Freon is used for the cooling of Orbiter electronic avionics, payloads and the crew module. Due to information that indicates freon is harmful to the environment, proper disposal is practiced at KSC. [NASA/KSC Release No. 153-92, Nov. 1992.]

STS 53: LAUNCH PAD VALIDATIONS

Technicians at Launch Complex 39A have completed pad validations prior to Discovery's STS 53 mission liftoff, now targeted for the first week in December. The solid rocket booster flight readiness test has also been completed. Work in progress: inertial measurement unit (IMU) calibrations; X-rays of reaction control system bellows; main engine flight readiness test; changeout of right booster integrated electronics assembly (IEA); STS 53 astronaut arrival at the Shuttle Landing Facility today at 4:30 p.m. EST. Work scheduled: helium signature leak check of main propulsion system November 11; retest of right booster hydraulics and IEA November 11; astronaut emergency egress training November 11 and 12; Shuttle training aircraft flights on November 11 and November 12; TCDT count begins at 8 a.m. November 12 and reaches T-0 at 11 a.m. November 13; changeout of SRB fuel isolation valves on November 13; auxiliary power unit hot firing this weekend. [SPACE SHUTTLE STATUS REPORT, Nov. 10, 1992; Banke, FLORIDA TODAY, p. 5A, Nov. 11, 1992.]

November 11: **STS 53 CREW TRAINS AT KSC**

Today the STS 53 crew of Discovery will learn how to use the emergency egress system at Launch Complex 39A; in an emergency the astronauts would climb into the slidewire basket for a rapid ride down the 1,200-foot wire to a bunker on the west side of the pad. "It's the usual drill; nothing out of the ordinary," said KSC spokesman **George Diller**. The terminal countdown demonstration test begins tomorrow at 8:00 a.m. and runs until 11:00 a.m. on Friday morning. Today workers tested a spare electronics assembly on the right-hand solid rocket booster; it replaces an assembly which failed last week. Technicians also conducted an important test of the main propulsion system, the helium signature leak test. [Halvorson, FLORIDA TODAY, p. 2A, Nov. 12, 1992.]

November 12: **NASA PERSONNEL CHANGES**

NASA Administrator **Daniel S. Goldin** today announced that **Paul F. Holloway**, in addition to his responsibilities as Director of Langley Research Center (LaRC) (Hampton, VA), temporarily will be assigned to NASA Headquarters as a special assistant to the Administrator. "Paul has a distinguished record of service with NASA and has provided unparalleled leadership at Langley. I'm very pleased to announce his new position as special assistant at Headquarters, where he will be intimately involved with the day-to-day operations of the agency," said Goldin. The Administrator also announced today that **Don G. Bush**, Assistant Administrator for Procurement, would be leaving the agency on January 11, 1993. Bush, who joined the agency in 1990 after numerous assignments in the Department of Defense, plans to pursue opportunities in the private sector. [NASA/KSC Release No. 92-202, Nov. 12, 1992; "Goldin Announces Appointments," FLORIDA TODAY, p. 9E, Nov. 15, 1992.]

DISCOVERY: PRE-LAUNCH STATUS

At Launch Complex 39A, technicians have completed Discovery's inertial measurement unit calibrations; changing out and retesting the right booster's integrated electronics assembly (IEA); the Space Shuttle main engine (SSME) flight readiness test (FRT); main propulsion system helium signature leak check and leak checks of the Orbiter/external tank quick disconnects. Work in progress prior to the STS 53 mission of Discovery: terminal countdown demonstration test (TCDT); X-rays of the reaction control system bellows; star tracker inspection; astronaut emergency egress training at Pad 39A; and

Shuttle training aircraft (STA) flights. Work scheduled: conclusion of the TCDT at 11 a.m. November 13; changeout of the left and right SRB fuel isolation valves on November 13; OMS/RCS hypergolic propellant loading activities during the weekend; retraction of the rotating service structure for performance of an APU hot firing on November 16. [SPACE SHUTTLE STATUS REPORT, Nov. 12, 1992; Halvorson, FLORIDA TODAY, p. 2A, Nov. 13, 1992.]

CHUTE MADE COLUMBIA VEER

When Columbia landed at Kennedy Space Center to conclude its STS 52 mission, it veered ten to fifteen feet off the 300-foot wide runway's center line. NASA officials said today that the Orbiter's drag chute had caused the vehicle to veer. "It's not much of a pull; ten to fifteen feet on a 300-foot wide runway is not a big deal. In fact, it didn't cause me any concern at all," said Columbia's commander **James D. Wetherbee**. Wetherbee and Pilot **Robert L. "Hoot" Gibson** countered the drift by stepping on Columbia's rudder pedal and using the nose wheel steering system to control the Orbiter. NASA said the drifting appears to occur only when the chute is deployed before the nose wheel touches down on the runway. Discovery commander **David M. Walker** said, "I don't think it's a major concern for us, provided we understand the conditions under which we deploy it. We're still gathering data, but I'm not concerned that if we do the test that we'll have any problems." The possibility of modifications is being explored by NASA. Discovery may land at Edwards Air Force Base, CA, in order for NASA scientists to study more closely the effects of crosswinds. [Halvorson, FLORIDA TODAY, p. 2A, Nov. 13, 1992; Banke, FLORIDA TODAY, p. 1A, Nov. 14, 1992.]

November 13:

DISCOVERY: STS 53 PRE-LAUNCH WORK

At Launch Complex 39A, technicians have completed X-rays of the reaction control system bellows and have inspected the Discovery's star tracker. Work in progress on terminal countdown demonstration test (TCDT); changeout of the left and right SRB fuel isolation valves and the launch readiness review (LRR). OMS and RCS propellant loading will take place November 14 and 15; the rotating service structure will be retracted on November 16. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 13, 1992.]

ENDEAVOUR: STS 54 PREPARATIONS

Endeavour's next mission - STS 54 - is targeted for the second week of January, 1993. The six-day mission will have a crew of five and deploy the TDRS-F and the Diffuse X-Ray Spectrometer (DXS). Presently in OPF Bay 1, the mission's crew equipment interface test (CEIT) has been completed. Other completed tasks include: ammonia boiler servicing; payload airborne support equipment Interface Verification Test; transfer of IUS/TDRS to Launch Complex 39B; installation of DXS payload in cargo bay on Nov. 10; DXS interface verification test. Work in progress: OMS thruster reaction control system bellows removal and replacement; drag chute closeouts/door installation; Orbiter/external tank door functional testing; waste containment system functional testing; main propulsion system leak checks (hydrogen side); mid-body closeouts. Work scheduled: test cycle flight controls and aerosurfaces; tire checks/pressure topoff; aft compartment leak checks and closeouts; Orbiter structural leak checks; crew compartment closeouts; TDRS-F fueling at LC 39B. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 13, 1992.]

COLUMBIA: STS 55 PROCESSING WORK

In OPF Bay 2, a number of processing tasks on Columbia have been completed: USMP payload removal; remote manipulator arm (RMS) removal; main engine heat shields removal; waste containment system removal; wheels and tires removal; hypergolic system and APU deservicing; post flight system inspections; main engine inspections; Ku band antenna testing; Spacelab D-2 mission sequence test. Work in progress for STS 55: powering up Orbiter systems electrical testing; forward reaction control system deservicing and removal preparations; main engine removal; main propulsion system leak checks (hydrogen side); wheel and tire re-installation; star tracker door cycle testing; left hand payload bay door radiator #1 inspections; tile repair and replacement. Work scheduled: removal of window #1; removal of the forward reaction control system; removal and replacement of the freon pump package;crew hatch functional test; S-Band air-to-ground antenna testing; drag chute system deservicing; Orbiter structural inspections. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 13, 1992.]

STS 53: LAUNCH READINESS REVIEW

The Launch Readiness Review for Space Shuttle mission STS 53 was held today at KSC. Following the review, KSC mission managers deemed Shuttle Discovery and the KSC launch team ready to support launch during the first week of December. A firm launch date will be determined at the Flight Readiness Review scheduled for Thursday, November 19, at Kennedy Space Center. Speaking of the role of the managers in the FRR, KSC spokesman **George Diller** said, "They'll go through everything Discovery has been through since its last flight." Discovery last flew in January and since that mission, the Orbiter has been closely inspected and extensively modified. A drag chute has been installed; improvements were made to the nose wheel steering mechanism and improved auxiliary power units have been added. At Launch Complex 39B, technicians are fueling Endeavour's prime cargo, the Tracking and Data Relay Satellite. Endeavour will roll to the launch pad next week. [Buckingham, Nov. 13, 1992, KSC Press Site; Halvorson, FLORIDA TODAY, p. 2A, Nov. 17, 1992.]

November 15: PITTNER RECEIVES SILVER SNOOPY

"We are very proud that **Dan [Pittner]** has received this received this [Silver Snoopy] award," said **John Million**, Boeing Inertial Upper Stage Program Manager. "He is a skilled and highly motivated person whose goal is 100 percent flight success and safety. After a redundant inertial measurement unit failed on STS 44, Dan's quick turnaround in removing, replacing and retesting the unit allowed a successful Defense Department launch and flight." Pittner was presented his award by astronaut **Andrew M. Allen**. ["Boeing Employee Receives Silver Snoopy," FLORIDA TODAY, Nov. 15, 1992.]

November 16: DISCOVERY: CRUCIAL TEST

A hot firing of Discovery's auxiliary power units will occur today; it is a crucial pre-launch test that will enable final preparations to continue. The test will take place at 10 p.m. following the retraction of the rotating service structure at 6:00 p.m., according to KSC spokesman **George Diller**. He said, "Right now, we're right on schedule." Last weekend, workers loaded propellants into the Orbiter's onboard storage tanks. SRB fuel isolation valves have been changed out and technicians have finished work in the X-ray reaction control system thrusters. Also scheduled for today are OMS/RCS fuel system disconnects and purges. Technicians will begin SRB closeouts and Orbiter aft

compartment closeouts November 18; final ordnance work will begin Nov. 22.[Brown, FLORIDA TODAY, p. 2A, Nov. 15, 1992; Brown, FLORIDA TODAY, p. 3A, Nov. 16, 1992; SPACE SHUTTLE STATUS REPORT, Nov. 16, 1992.]

LAUNCH COMPLEX 39B ACTIVITIES

Fueling operations for the TDRS-F payload at Launch Complex 39B will be conducted Tuesday (November 17) through Thursday (November 19). On Orbiter Endeavour in OPF Bay 1, bellows changeout on one of the RCS thrusters is in work and on schedule. Cleaning of the payload bay is underway in preparation for closing the payload bay doors Wednesday night. The Orbiter structural leak check will follow on Thursday, with aft compartment closeouts and the weight and center of gravity determinations set for Friday, November 20. Rollover to the Vehicle Assembly Building transfer aisle is targeted for 3rd shift on the morning of November 21. [Banke, FLORIDA TODAY, p. 9E, Nov. 15, 1992; SPACE SHUTTLE STATUS REPORT, Nov. 16, 1992.]

DISCOVERY: PRE-LAUNCH STATUS

Post-test analysis of the Discovery's APU hot firing data showed that the #1 fuel pump inlet pressure transducer had a higher than acceptable reading. This device furnishes APU fuel pressure information. Whether the unit will require a changeout is under discussion. If this work is done, about a day of two of the remaining days of contingency time will be necessary to complete the activity. The primary payload of STS 53 has been delivered to Launch Complex 39A. The mission is for the Department of Defense. Work in progress: connection of Orbiter midbody umbilical (OMBU); liquid oxygen pump leak checks; aft main engine compartment and crew compartment cleaning. Work scheduled: vehicle powering up; OMBU leak checks also; beginning SRB closeouts and Orbiter aft closeouts; installation of contingency EVA space suits; installation of the primary payload; Orbiter/payload interface verification test (IVT); final ordnance work November 22. [SPACE SHUTTLE STATUS REPORT, Nov. 17, 1992; Halvorson, FLORIDA TODAY, p. 1A, Nov. 18, 1992.]

November 18:

DISCOVERY: STS 53 PREPARATIONS

The decision on whether to changeout the #1 fuel pump inlet pressure transducer will be made at the flight readiness review for STS 53. A fly-as-is option is under assessment; if the changeout is made, contingency time on November 21 could be used for the activity. Meanwhile, mating of Discovery's mid-body umbilical has been completed at Launch Complex 39A. Work in progress: closure of the rotating service structure; powering-up of the Orbiter; leak checks of the Orbiter Midbody Umbilical (OMBU); beginning of solid rocket booster closeouts; beginning of avionics bay closeouts; start closeouts of the Orbiter aft main engine compartment; continue aft main engine compartment and crew compartment cleaning; troubleshooting APU #1 fuel pump inlet pressure transducer. Work scheduled: installation tomorrow of contingency EVA space suits and primary payload. The flight readiness review will be conducted also be conducted November 19. The Orbiter/payload interface verification test (IVT) will be held November 20 and final ordnance work should be completed November 22. [SPACE SHUTTLE STATUS REPORT, Nov. 18, 1992.]

LOCKHEED WINS BASE OPERATIONS CONTRACT

Lockheed Space Operations Company won out over three competitors to win Kennedy Space Center's base operations contract, worth an estimated $1.9 billion over the ten years of the contract. After the first four years, there will be two three-year options. Lockheed will now become the second-largest employer in the county, after Harris Corp. **Gerald Oppliger**, president of Lockheed, said, "We are delighted with this contract award. I'm very gratified that NASA has demonstrated such confidence in us, and I'm proud of the outstanding proposal our people turned in." (Melbourne, FL). EG&G Florida has operated the contract for the past ten years. Lockheed officials said they expected to re-employ the "vast majority" of current BOC employees, but spokesman **John Williams** said, "I would think that the work force would be smaller." He did not say how much smaller. Lockheed already employs 6,200 as the Shuttle processing contractor. The new base operations contract includes security services, doctors and nurses at the occupational health facility, firefighters, computer technicians, janitors and handlers of toxic rocket fuel. Lockheed will subcontract such services as the Kennedy Space Center Library and mail operation.

EG&G president **James Dubay** said, "Obviously we are extremely disappointed about the news that we weren't selected, because we know we provided outstanding service to NASA. We don't yet have any specifics about why we weren't selected, so we cannot comment any further except to say that we want the transition process to be as smooth as possible for our employees and we will cooperate fully with NASA and Lockheed to ensure that occurs." NASA Procurement chief **Wes Dean** said, "It was a very close competition." He said he would have no specifics on the evaluations until after he has debriefed the losing companies; that will take two or more days.[Date, THE ORLANDO SENTINEL, p. C-1, Nov. 19, 1992; Liden and Halvorson, FLORIDA TODAY, pp. 1A-2A, Nov. 19, 1992; Reitz, FLORIDA TODAY, Nov. 19, 1992; KSC News Release No. C92-20, Nov. 18, 1992; Suskind, THE WALL STREET JOURNAL, p. A5, Nov. 19, 1992; Boylan, FLORIDA TODAY, Nov. 26, 1992.]

BONEBERGER WINS SNOOPY AWARD

Joyce Boneberger has been awarded a Silver Snoopy by Astronaut Andrew Allen for her role in saving money and time by developing a set of electronic mail procedures for secretaries who log onto KSC's computer network. Boneberger is a secretary for McDonnell Douglas. ["McDonnell Douglas," STAR-ADVOCATE, Nov. 18, 1992.]

CRANE INVESTIGATION CONCLUDES

An investigation board, chaired by **Jackie E. Smith**, Director of Safety and Reliability, has completed a thorough review of cranes used in lifting flight hardware inside the 52-story Vehicle Assembly Building (VAB). Center Director **Robert L. Crippen** appointed an investigation board to examine an August 11 incident involving a 250-ton crane that suddenly and unexpectedly accelerated while moving a Space Shuttle solid rocket booster segment in High Bay 1 of the VAB. Although unable to determine the exact reason, the board found that the most probable causes of the crane's sudden movement were contamination in the motor generator and excessive resistance of the relay contacts in the crane's control system. The generator, known as a metadyne, amplifies an operator initiated control signal to regulate trolley speed.

All components of the crane were carefully tested in KSC's Malfunction Laboratory and only the metadyne and the relays exhibited abnormal results. During the course of the investigation, the board found that the cleaning process for the metadyne left a residue that could have caused the unexpected movement. Also, laboratory tests of the relay controls demonstrated unwanted resistance changes. Consequently, to improve crane reliability and reduce risk, the metadynes have been replaced and the cleaning process has been changed. In addition, operating rules regarding speed selection have been refined. As recommended by the board, the metadynes on all VAB cranes are being replaced with new solid state control systems. Officials are also investigating the continued use of the present control relays. This incident did not cause any injuries to personnel or damage to hardware or facilities.

Assisting Smith on the investigation were board members: **David Kelley**, Chief, Structural System Branch, Ground Engineering Directorate; **Howard Meeks**, Systems Engineering Section, Payload Operations Directorate; **Ronald Eatman** of the Project Engineering Staff, Facilities Engineering Directorate; **James Myers**, Systems Assurance Office, Mission Assurance Directorate; **Arthur Clark**, Cables and Special Power Section, Facilities Engineering Directorate; and **Todd Steinrock**, Mechanical Section, Facilities Directorate. **Malcolm Glenn** served as the safety advisor, **John Biedenham** provided legal assistance and **Lisa Malone** was the public affairs representative. Board functions include investigating the facts surrounding the mishap, determining the probable cause, assessing the possibility of a recurrence or similar mishap and recommending corrective action. [KSC Release No. 158-92, Nov. 18, 1992; Banke, FLORIDA TODAY, p. 4A, Nov. 18, 1992.]

SPEEGLE WINS KSC CONTRACT

Speegle Construction, Inc. (Cocoa, FL) has been awarded a $197,000 fixed price contract to replace portions of the roof of the Operations and Checkout (O & C) Building at Kennedy Space Center. The small business firm began work on the contract October 26, 1992, and is required to complete this effort by April 24, 1993. This contract is for the Phase II and Phase III segments of the project to replace the entire O & C roof, which covers more than 220,000 square feet. The O & C Building, constructed in 1965 to support the Apollo program, houses astronaut crew quarters, clean room facilities and a high bay area where horizontal Space Shuttle payloads , primarily Spacelab modules, are processed. Some recent Spacelab missions include Spacelab-J in September 1992 and the U.S. Microgravity Laboratory in June of this year. [KSC Release No. 152-92, Nov. 18, 1992.]

November 19:

DISCOVERY: FRR UNDERWAY

The flight readiness review for STS 53, Discovery's next mission, is underway today at Kennedy Space Center. Technicians at Launch Complex 39A have finished loading propellants for OMS, RCS, APUs and HPUs. Work in progress: checkout of solid rocket booster thrust vector control systems; payload transfer into payload bay; installation of contingency EVA space suits; Orbiter aft closeouts and leak checks of the Orbiter mid-body umbilical (OMBU). STS 53 is expected to begin in the first week of December and land a week later at Kennedy Space Center. [SPACE SHUTTLE STATUS REPORT, Nov. 19, 1992.]

[] **STS 53 TO LAUNCH DEC. 2**

Managers here today officially targeted December 2 for launch the Space Shuttle Discovery on its 15th mission. The decision was made at the conclusion of today's STS 53 flight readiness review at NASA's Kennedy Space Center. The launch window opens at 6:59 a.m. EST. The primary payload for this ninth dedicated Department of Defense (DoD) mission is designated DoD-1 and is classified. Although there will be no public discussion of the identify or purpose of DoD-1 operations before, during or after the mission, a number of secondary experiments in the cargo bay and in Discovery's cabin will be conducted openly throughout the planned 7-day, 5-hour flight. Commanding this 53rd Space Shuttle mission aboard the newly refurbished Discovery will be 48-year-old Navy Captain **David M. Walker**, making his third Shuttle flight. Sitting in the right seat will be Pilot **Robert D. Cabana**, 43, a Marine Colonel making his second flight. Three mission specialists will round out the five-man STS 53 crew: Air Force Colonel **Guion S. Bluford**, 50, making his fourth flight; and two Army Lt. Colonels - **James S. Voss**, 43, making his second flight, and **Michael R. U. Clifford**, 40, flying into space for the first time. [KSC Release No: N92-99, Nov. 19, 1992; Halvorson, FLORIDA TODAY, p. 11A, Nov. 20, 1992.]

[] **WHITE HOUSE REPORT: REPLACE SHUTTLES**

A White House report, created by the Vice President's Space Policy Advisory Board, has recommended that "the Air Force build a new launch vehicle to serve the nation's spacelift needs and replace the Space Shuttle by 2005." An author of the report, former Air Force Secretary **Edward C. "Pete" Aldridge** said, "Spacelifter is the best answer from the taxpayers' point of view." Aldridge pointed out that Shuttles cost $5 billion annually. NASA managers at Kennedy Space Center declined to comment. NASA Administrator **Daniel S. Goldin** said regarding the report, "That Shuttle program is the No. 1 priority for NASA. It is our only means of human access to space for the next decade and a half. There is no stepping away from that. That is chiseled in granite. That's very important for the folks down there [Kennedy Space Center] to know." [Banke, FLORIDA TODAY, p. 1A, Nov. 20, 1992; Holton, THE ORLANDO SENTINEL, p. A-14, Nov. 20, 1992.]

[] **SECOND LAUNCH TRY FOR DELTA 2**

The Air Force will try for a second time to launch its Delta 2 rocket this weekend. The first effort, on November 5, was unsuccessful when the first stage engine did not ignite. Air Force officials continue to study the abort and have drawn no firm conclusions as to its cause. The Navstar Global Positioning System satellite, the Delta's payload, was not damaged in the failed attempt to launch. ["Delta 2 That Failed to Launch Might Try Again On Saturday," FLORIDA TODAY, p. 11A, Nov. 20, 1992.]

November 20: **DISCOVERY: PAYLOAD INSTALLED**

At Launch Complex 39A where technicians have installed the classified DoD payload into Discovery's cargo bay, preparations for the launch of STS 53 continue without incident. Avionics bay closeouts have been completed as has the Orbiter aft confidence test and a disconnect/closeout of APU #1 fuel pump inlet pressure transducer. Work in progress today: aft main engine compartment closeouts; main propulsion system insulation foaming; solid rocket booster closeouts; changeout of #1 data display unit; payload interface verification test; and OMBU leak checks. Scheduled work: final ordnance work November 22; OMS/RCS fuel tank pressurization also on the 22nd; loading mass memory units November 23 and external tank purges on November 24. At present there are no

issues of concern for launch managers. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 20, 1992.]

ENDEAVOUR: STS 54 PROCESSING

A number of processing activities leading to Endeavour's STS 54 mission have been completed while the Orbiter is in OPF Bay 1: TDRS fueling at Launch Complex 39B; aft compartment closeouts; crew compartment closeouts; external tank door functional test; Orbiter structural leak check; aft compartment leak check; right nose wheel changeout; nose wheel steering retest; payload airborne support equipment interface verification test; DXS interface verification test. Work in progress: weight and center of gravity determination and mating to Orbiter transporter. Scheduled work includes: rollover to the Vehicle Assembly Building transfer aisle November 21; attaching lifting sling and Orbiter lifting preparations that night; mating to external tank and solid rocket booster stack November 22. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 20, 1992.]

STS 55: COLUMBIA PROCESSING ACTIVITIES

Columbia's three main engines and the forward reaction control system have been removed; window #1 has been removed and replaced. Technicians have completed payload bay deconfiguration and Orbiter structural inspections. Work in progress: powered-up Orbiter systems electrical testing; freon closed-loop coolant system modifications; X-ray reaction control system bellows; OMS/RCS pressure decay test; tile repairs; installation of payload bay liners and stacking of the left-hand solid rocket booster in the VAB's High Bay 3. Scheduled activities include: configuration of the payload bay for Spacelab-D2; tile post-flight inspections; tile repair; chin panel rework and auxiliary power unit leak and functional checks. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Nov. 20, 1992.]

November 22:

DELTA LAUNCH SUCCESSFUL

Tonight at Cape Canaveral Air Force Station's LC 17A the Air Force successfully launched its Delta 2 rocket. The vehicle carried a military satellite which will be used to guide troops on missions around the world. Two previous attempts to launch were scrubbed; the first due to bad weather and the second because of a technical problem in the rocket's first stage main engine. The satellite became part of the Navstar Global Positioning System. [Banke FLORIDA TODAY, p. 1A, Nov. 21, 1992; Banke, FLORIDA TODAY, p. 1A, Nov. 22, 1992; Halvorson and Banke, FLORIDA TODAY, p. 1A, Nov. 23, 1992.]

KSC PROJECTS ON HOLD

Plans to construct a 24,000-square foot high bay to process new, more powerful, Shuttle boosters have been shelved for the time being; there have been delays in developing the new booster. "We're the last set of facilities in line on ASRM [Advanced Solid Rocket Motors] projects," said **James Towles**, KSC Facilities Director. Money for the Kennedy Space Center project is expected to be in the 1994 budget. The new boosters will have three instead of four segments and will be too big to be processed in current facilities. [Brown, FLORIDA TODAY, p. 10E, Nov. 22, 1992.]

OPEN HOUSE AT KSC

More than 32,000 people took advantage of the opportunity to tour Kennedy Space Center during Open House this past weekend. "This is a real treat," said Jan Brown (Melbourne, FL). "You see this on TV and read about it in the newspaper, but it's even more exciting to see a real spaceship in person." [Banke, FLORIDA TODAY, p. 2A, Nov. 22, 1992.]

November 23: **DISCOVERY'S COMPUTERS TO BE LOADED**

On KSC's to-do list today is a procedure to load Discovery's onboard computers with the programs necessary to fly the Discovery during its STS 53 mission which is currently slated to begin with a December 2 launch from Launch Complex 39A. Discovery has five general purpose computers and two mass memory units which house all the Shuttle's programs. [Banke, FLORIDA TODAY, p. 4A, Nov. 23, 1992.]

STS 53: ORDNANCE OPERATIONS FINISHED

At Launch Complex 39A, technicians have completed final ordnance operations upon Discovery prior to its December 4 launch on its STS 53 mission. Technicians also completed OMS/RCS tank pressurization and the changeout of DDU #1. Work in progress today: auxiliary power unit tank pressurization and closeouts; loading mass memory units (MMU); main engine sensor calibrations; aft main engine compartment closeouts; solid rocket booster closeouts; payload closeouts. Scheduled work includes: external tank purges; closing the payload bay doors; retesting the Data Display Unit #1; orbiter aft systems confidence test and picking up the countdown at 11 a.m. on November 29. Due to the Thanksgiving holidays on November 26 and 27, no work is scheduled for the launch team. November 28 is a contingency day for any catch-up or unscheduled work. [SPACE SHUTTLE STATUS REPORT, Nov. 23, 1992.]

November 24: **DISCOVERY: STS 53 MMU'S LOADED**

The main memory units (MMUs) of Discovery at Launch Complex 39A have been loaded with flight software. Main engine sensor calibrations have been completed as have auxiliary power unit tank pressurization and closeouts. Work in progress: launch countdown preparations in LCC Firing Room 1; external tank purges; crew compartment closeouts; aft main engine compartment cleaning and closeouts; solid rocket booster closeouts; closing of payload bay doors; DDU #1 retest. Work scheduled: Orbiter aft systems confidence test; installation of aft compartment flight doors. The countdown for STS 53 will be picked up at 11 a.m. November 29 for launch on December 2. Aft compartment closeout activity today and tomorrow includes documentation photographs and the removal of access platforms, supplemental lighting, communications gear, and protective caps and covers. [SPACE SHUTTLE STATUS REPORT, Nov. 24, 1992.]

DISCOVERY: MAIN ENGINE CONTROLLER OK'D

A main engine controller aboard Discovery experienced a minor problem after activation today; it was tested for about 16 hours subsequently and mission managers feel confident that the computer will operate properly for flight. Nevertheless, managers will conduct a retest of the controller on November 30. Similar problems have surfaced before other flights. [Banke, FLORIDA TODAY, p. 1A, Nov. 25, 1992.]

November 25: DISCOVERY: PRESSURE DECAY

An extra three hours of hold-time will be added into the launch countdown at the T-19 hour mark to give managers extra time to examine a slight pressure decay that could be in ground support equipment or in the oxygen side of the power reactant storage and distribution system. Officials want the extra time to evaluate the situation following the holiday period. Discovery's payload bay doors were closed for flight at 3:45 p.m. yesterday; the external tank has been purged in preparation for fueling at Launch Complex 39A. Work in progress today for the STS 53 mission: closeouts of the aft engine compartment; launch countdown preparations; preparing the crew compartment for flight; solid rocket booster closeouts; moving the booster flame deflectors to the launch position. Scheduled work activities: bolting the doors on the aft compartment for flight; powering down the vehicle; beginning the launch countdown at 8 a.m. November 29; arrival of the crew at the SLF at 1 p.m. November 29; launch December 2 at 6:59 a.m. EST. Kennedy Space Center workers will have off Thursday and Friday for the Thanksgiving holiday. A number of employees will work November 28 to prepare for the start of the launch countdown and the STS 53 launch team will be at stations beginning with the countdown's commencement on November 29. [SPACE SHUTTLE STATUS REPORT, Nov. 25, 1992; Banke, FLORIDA TODAY, p. 9A, Nov. 26, 1992.]

STS 54: ELEMENTS MATED

In the Vehicle Assembly Building, Endeavour has been mated with its external tank and solid rocket boosters. Workers are closing out the electrical connections between the Orbiter and external tank in preparation for rollout to Launch Complex 39B on December 3. Preparations are also underway to power up the vehicle for the shuttle interface test scheduled for December 1. Endeavour's third mission, STS 54, will begin after the first of the year. [SPACE SHUTTLE STATUS REPORT, Nov. 25, 1992.]

COLUMBIA: STS 55 PROCESSING

Columbia, the senior member of NASA's Space Shuttle fleet, is currently in OPF Bay 2 at Kennedy Space Center where the Orbiter is having a drag chute installed. Technicians are X-raying the orbital maneuvering system pods; purging the freon cooling system; conducting leak and functional tests of the auxiliary power units and inspecting the vehicle's hydraulic system. Columbia's STS 55 mission will be the second flight of 1993. [SPACE SHUTTLE STATUS REPORT, Nov. 25, 1992.]

BEACH CLOSED UNTIL MID-JANUARY

Playalinda Beach will be closed to visitors from November 29 through mid-January due to Space Shuttle operations. Space Shuttle Discovery is scheduled to be launched from LC 39A on Mission STS 53 at 6:59 a.m. EST, December 2, 1992. The beach closing is required three days prior to a Space Shuttle launch from 39A, which necessitates closing on November 29. On December 3, the Space Shuttle Endeavour will be rolled out to Launch Complex 39B in preparation for the STS 54 January 1993 launch. Pad 39B is KSC's northernmost pad and requires the beach be closed whenever a Shuttle is present there. [NASA/KSC News Release No. 160-92, Nov. 25, 1992; "Playalinda Beach To Close," FLORIDA TODAY, Nov. 27, 1992.]

November 27: **PRESSURE LOSS PROVOKES TESTS**

A problem with ground support equipment at Launch Complex 39A has causing NASA to decide to conduct some tests today, rather than tomorrow; an unwanted drop in pressure in a liquid oxygen line was noted at the pad today. KSC spokesman **Karl Kristofferson** said the problem was not with Discovery or any of its flight hardware. "Neither of those operations [the tests] are expected to delay Wednesday's scheduled launch of Discovery at 6:59 a.m.," said Kristofferson. Meanwhile, workers will either repair or replace a seal within a liquid hydrogen storage tank aboard Discovery. [Banke, FLORIDA TODAY, p. 8A, Nov. 28, 1992.]

November 29: **STS 53: COUNTDOWN STARTS TODAY**

At 8 o'clock this morning the countdown clock will start at Kennedy Space Center for the STS 53 mission of Discovery. The five-man crew of this Department of Defense mission includes: Commander **David M. Walker**, Pilot **Robert D. Cabana** and Mission Specialists: **Guion S. Bluford, Michael R. U. Clifford** and **James S. Voss.** Weather appears to the prime concern for launch at present. A plan to land the Orbiter with a computer at the controls has been canceled. [Banke, FLORIDA TODAY, p. 1A, Nov. 29, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-11, Nov. 29, 1992; See Crew Profiles in FLORIDA TODAY, p. 9E, Nov. 29, 1992; "Countdown for Discovery's Wednesday Launch Begins," THE ORLANDO SENTINEL, Nov. 30, 1992.]

November 30: **STS 53: WEATHER 60% UNFAVORABLE**

The weather forecast for December 2 calls for a 60% chance of violating the weather rule prohibiting launch if there is a steady-state wind below 5 knots with a temperature of less than 47 degrees for longer than 30 consecutive minutes. Meanwhile, KSC technicians have completed a number of tasks concerning preparations to launch Discovery on its STS 53 mission: Orbiter potable water sampling; crew arrival; crew medical exams and flight suit check this morning and commander and pilot Shuttle Training Aircraft (STA) flights this afternoon. Work in progress: launch countdown in LCC Firing Room 1; loading fuel cell cryogenic reactants; activating Orbiter navigation system; troubleshooting pyrotechnic initiator cable on left-hand booster holddown post; preparations to retract rotating service structure. Work scheduled: remove and replace holddown indicator cable this afternoon; retest holddown post indicator cable tomorrow; retract Orbiter midbody umbilical (OMBU) tonight; training flights for astronauts tomorrow; retraction of rotating service structure for launch at 11 a.m. December 1. [Banke, FLORIDA TODAY, pp. 10E & 9E, Nov. 29, 1992; SPACE SHUTTLE STATUS REPORT, Nov. 30, 1992; Banke, FLORIDA TODAY, pp. 1A-2A, Dec. 1, 1992.]

LAUNCH WEATHER RULES DISCUSSED

NASA managers are meeting today to discuss Discovery's STS 53 countdown and the chilly weather forecast for launch day. "Their big concern will be the temperatures and the temperature-wind relationship," according to Shuttle Weather Officer **Ed Priselac** of the 45th Space Wing. By contrast to the procedure in use at the time of the 1986 Challenger accident, heaters installed around the main booster joints keep seals properly conditioned during every countdown. [Banke, FLORIDA TODAY, pp. 1A-2A, Nov. 30, 1992; Date, THE ORLANDO SENTINEL, pp. A-1 & A-4, Dec. 1, 1992.]

STS 53 CREW ARRIVES

"It's good to be back in Florida. We hope we don't stay here very long," said STS 53 Commander **David M. Walker** upon his arrival with his crewmates today at the Shuttle Landing Facility. Walker added, "We're planning to go up as quickly as the airplane's ready, and we think that's going to be Wednesday. Everything we're hearing about the condition of the Orbiter says it's ready to go. We're ready to go, and we're looking forward to a good mission." Meteorologists currently estimate a 50 percent chance of acceptable weather for launch between 6:59 and 9:29 a.m. on December 2. [Banke, FLORIDA TODAY, p. 1A, Nov. 30, 1992.]

KSC AWARDS BRIDGE CONTROLS CONTRACT

Military Construction Corp. (Merritt Island, FL) has been awarded a $1,089,000 fixed price contract to replace the electrical control systems of the four drawbridges at Kennedy Space Center. Work under this contract is scheduled to begin in February 1993 and must be completed by June 1994. The contract calls for the small business firm to replace operator controls in the control houses of the Indian River bridge on NASA Causeway West, the Banana River bridge on NASA Causeway East, the Haulover Canal bridge on Kennedy Parkway North and the JJ Railroad bridge north of Titusville (FL). The existing controls are original equipment installed when the bridges were constructed in the early 1960's and are considered to be obsolete. The new operating systems will include computerized control of the bridge mechanical systems. Primary advantages of the new systems over the existing equipment are less operator involvement, a higher degree of reliability and reduced maintenance costs. [KSC Release No. 159-92, Nov. 30, 1992.]

DECEMBER

December 1: DISCOVERY: LOADING PROPELLANTS

Today at Launch Complex 39A workers removed and replaced the left booster holddown post pyro initiator cable. They loaded cryogenic reactants into Discovery and activated the Orbiter's navigation and communications system. As part of the final preparations for the STS 53 launch tomorrow, they retracted the Orbiter midbody umbilical (OMBU). Final astronaut medical examinations were conducted as well as a flight suit fit check. Work in progress: launch countdown in the Launch Control Center's Firing Room 1; troubleshooting the Orbiter Electronics Interface Unit (EIU); astronaut T-38 training flights; astronaut status briefings on countdown, Discovery, payload; retracting rotating service structure; loading the Space Tissue Loss experiment; configuring cockpit switches for launch; activation of Orbiter fuel cells. A re-test of the left booster holddown post pyrotechnic initiator cable is scheduled. [SPACE SHUTTLE STATUS REPORT, Dec. 1, 1992.]

SPACE STATION MANAGEMENT CHANGES

Culminating 6 months of reviews, NASA today announced plans to consolidate some management functions for the Space Station Freedom program and create a contractor-led integration team to ensure the successful building and deployment of the international space station. "These moves will improve overall program management and significantly strengthen the integration of the various station elements," said **Arnold Aldrich**, Associate Administrator for Space Systems Development. "We foresee no schedule or budgetary impact from these changes. In fact, when fully implemented, these changes will reduce 'overhead' costs and strengthen program execution and accountability."

NASA plans to combine the existing Level 1 (Headquarters) and Level II (Reston) Space Station Freedom offices in Reston, VA. This step will consolidate overall program management at Reston. "Reston will remain the focal point for the space station program for the foreseeable future," said Aldrich. NASA is working toward establishing a Joint Vehicle Integration Team (JVIT) at the Johnson Space Center (Houston, TX). The JVIT will be staffed by the 3 space station prime contractors (Boeing, McDonnell Douglas and Rocketdyne). NASA will manage the JVIT contract.

"It is my strong view, which is shared across NASA senior management, that these changes are essential to the successful implementation of this program," said Aldrich. "Further, they are consistent with the findings of a number of internal NASA reviews and with congressional direction. The changes are fully supported by the space station hardware contractors and by Grumman." Grumman is the space station engineering and integration contractor who will participate with the JVIT and who will continue at Reston as the program integration contractor. Aldrich said, "With these changes, the civil service manpower level at Reston will likely increase above the current level of about 210." Aldrich said **Richard Kohrs** will continue as Director, Space Station Freedom and will be located at Reston. He added that the Deputy Director for Program and Operations would be transitioned to the Johnson Space Station to provide for full and effective management of the Freedom program, including the JVIT.

According to Aldrich, details of these changes will be spelled out in a transition plan developed by Kohrs in mid-February 1993. The plan will clearly define the roles and responsibilities for the space station offices at Reston; the Lewis Research Center

(Cleveland, OH); the Johnson Space Center; the Marshall Space Flight Center (Huntsville, AL); and the Kennedy Space Center, FL. Kohrs plan also will address the longer-range plans to consolidate Space Shuttle and Space Station operations by mid-1997 and combine the Shuttle and Station programs by late 1999. "This will result in significant economies of scale in the outyear budget for Space Station operations and will greatly improve the overall operations management of both programs," said Aldrich.

"Over the course of the last few years, the men and women of the NASA team have made substantial progress in meeting key program milestones," Aldrich said. "However, as the program shifts its emphasis from design activities to hardware development, manufacturing and integration, the buildup to support these activities at the NASA Centers was planned and is required." Aldrich said these changes have been reviewed with the Office of Management and Budget and the Congress and will be presented to the President-Elect's transition team in the near future. [NASA Release: 92-214, Dec. 1, 1992; Halvorson, FLORIDA TODAY, p. 2A, Dec. 16, 1992.]

December 2: **DISCOVERY: STATUS REPORT**

Discovery was launched upon its STS 53 mission today at 8:24 EST; the launch was delayed 85 minutes because of cool weather at the launch pad which caused icing on the external tank. The prime payload - DoD-1 - was deployed about six hours after launch and the crew and Shuttle Orbiter remain in good condition. Landing is planned for December 9 at the Kennedy Space Center Shuttle Landing Facility after completion of its six-day flight. [Date, THE ORLANDO SENTINEL, pp. A-1 & A-8, Dec. 3, 1992; SPACE SHUTTLE STATUS REPORT, Dec. 3, 1992; Halvorson, FLORIDA TODAY, p. 1A, Dec. 2, 1992.]

December 3: **ENDEAVOUR ROLLOUT**

Today, Endeavour is being moved from the Vehicle Assembly Building to Launch Complex 39B; first motion occurred at 7:14 a.m. EST. The vehicle was expected to arrive at the pad by early afternoon and the rotating service structure will be deployed around the Orbiter by 5:30 p.m. today. "We're certainly not wasting any time getting the next one ready to go. We wanted to get it out to the pad as soon as we could and get as much work done as possible before we break for the holidays," said Kennedy Space Center spokesman **Bruce Buckingham**. Work scheduled: hook-up of ground support equipment and checkouts of systems between the mobile launch platform, the vehicle and the ground. Installation of the TDRS-F spacecraft into Endeavour's payload bay is scheduled to occur December 4, beginning at 6 a.m. The task is expected to be completed by midnight. Connections and checkouts between the Orbiter and satellite will occur throughout the weekend. Endeavour's terminal countdown demonstration test is set for December 16. [SPACE SHUTTLE STATUS REPORT, Dec. 3, 1992; Banke, FLORIDA TODAY, p. 4A, Dec. 3, 1992; Halvorson, FLORIDA TODAY, p. 6A, Dec. 4, 1992.]

December 4: **BOC CONTRACT PROTESTS**

NASA has been informed by the General Services Board of Contract Appeals and the General Accounting Office that all three losing contenders for the Kennedy Space Center Base Operations Contract (BOC) have filed protests over the selection of Lockheed Space Operations Co. for negotiations on the contract. The selection was made November 18. The BOC will be a cost-plus-award fee contract with incentive fee features covering an initial period of four years, with three priced 2-year options for a total potential period of

10 years and value of approximately $1.9 billion. For the past 10 years the contract has been held by EG&G Florida, Inc. EG&G Florida General Manager **James Dubay** said, "We are pleased to hear of NASA's plans to extend the base operations contract with EG&G Florida long enough for resolution of the protests." Approximately 3,000 persons are employed by EG&G for work on the BOC.

BAMSI, Inc. (Titusville, FL) and EG&G Florida, Inc. have filed their protests with the General Services Board of Contract Appeals. Westinghouse Electric Corporation's Government Operations Business Unit (Pittsburgh, PA) has filed its protest with the General Accounting Office. As a result, KSC is planning to extend the present contract with EG&G Florida long enough to allow for resolution of the protests and an orderly transition to the new contractor. It is expected that the protests will be resolved by mid-February. "The extension will cover the resolution of the protests," according to **Wes Dean**, Chief of Procurement. Lockheed Space Operations Co. spokesman **J. B. Klump** said, "Considering that a review is under way, it is not appropriate to respond at this time." Lockheed, already the Shuttle Processing Contractor, employs about 7800 people. [Boylan, FLORIDA TODAY, p. 14C, Dec. 3, 1992; KSC Release: 166-92; Dec. 4, 1992; Liden, FLORIDA TODAY, p. 1A, Dec. 5, 1992; Liden, FLORIDA TODAY, pp. 1A-2A, Dec. 23, 1992.]

[] **ENDEAVOUR: PAD VALIDATIONS**

Endeavour has been transferred from the Vehicle Assembly Building to Launch Complex 39B; the rotating service structure has been deployed around the Orbiter and the vehicle has been powered up. The payload bay and crew module doors have been opened and the TDRS/IUS covers have been removed. Work in progress today: installation of TDRS (manufactured by TRW) into the Orbiter payload bay; launch pad validations; gaining access to the aft engine compartment; preparations for prelaunch hypergolic propellant loads; main engine leak checks. Scheduled work: TDRS/Orbiter integration verification test and the helium signature leak test. Kennedy Space Center spokesman **Bruce Buckingham** said, "We're in good shape. The first mission of the new year should be processed without any problems." [SPACE SHUTTLE STATUS REPORT, Dec. 4, 1992; Halvorson, FLORIDA TODAY, p. 5A, Dec. 5, 1992.]

December 5: **USBI: EMPLOYEES OF THE MONTH**

United Technologies USBI has announced three employees of the month awards: **Patricia Ovington** was named September employee of the month; **Robert Church** and **Andrew Bradley** were named for October and November, respectively. USBI is a prime contractor working at Kennedy Space Center to assemble and refurbish Space Shuttle solid rocket boosters. ["USBI Announces Employees of Month," FLORIDA TODAY, p. 9E, Dec. 6, 1992.]

December 7: **ASRM TRANSPORTERS ARRIVE AT KSC**

The first major items of ground support equipment for the Advanced Solid Rocket Motor (ASRM) arrived at the Kennedy Space Center yesterday by barge. Called Kneel-Down Transporters (KDTs), they are special-purpose trucks designed to carry ASRM segments when loaded on special transportation pallets. Each segment with pallet weighs 795,000 pounds. The two KDTs are the first of four transporters that have been ordered from KAMAG Transportation Company of Germany. These transporters will eventually be taken to the Yellow Creek, Mississippi, manufacturing site for the ASRM when these facilities are

complete. The cost of the first set of transporters is $5.8 million dollars. Two more identical KDTs will be delivered later for use at KSC and will cost somewhat less money.

The term "kneel down transporter" refers both to the action of the transporter in kneeling down to pick up the pallets, as well as the configuration of a wheel set, or "bogie." Looking at individual bogie, one can see that its supporting leg does indeed have a pivot point like a knee--hence the term kneel down transporter. The mission of the transporter includes several tasks:

*move the filled and unfilled motor segments during the manufacturing process at Yellow Creek, Mississippi.

*load the completed rocket segments onto the barge at Yellow Creek for transportation to Kennedy Space Center, Stennis Space Center (Bay St. Louis, MS) or Marshall Space Flight Center (Huntsville, AL).

*unload the rocket motor segments from the barge at KSC for transportation to and between ordnance storage facilities and the Vehicle Assembly Building.

The transporter can also be configured for a variety of other general purpose applications. A 600-horsepower diesel engine furnishes the primary power for the transporter and its associated electrical and hydraulic systems. The transporter provides precision speed control ranging from creep to a maximum of ten miles per hour. The transporter is highly maneuverable, having a turning radius of only 30 feet. The front and rear bogies pivot at different angles about the two center rows of bogies, which are fixed. Combined with the precision speed control, this maneuverability allows the operator to position the transporter precisely under the load. An operator from KAMAG arrived with the first two transporters to drive them off the barge to their storage area which is north of the Vehicle Assembly Building. He will then assist in training the drivers who are to be furnished by the KSC Shuttle Processing contractor, Lockheed Space Operations Co. [KSC Release No. 165-92, Dec. 7, 1992.]

GROUNDBREAKING: SPACE EDUCATION CENTER

The Astronauts Memorial Foundation (AMF) board members, families of deceased astronauts and invited guests will join together in breaking ground for the new Center for Space Education at 10 a.m. on Thursday, December 10, at the construction site on the northwest side of KSC's Spaceport USA visitors center. Planned as a "living memorial" to U.S. astronauts who have given their lives in the line of duty, the new 44,000-square-foot education facility will provide a large area for educational materials to further students' knowledge and interests in space, science and aeronautics. NASA educational activities and teacher resources services, currently located at the visitors center, will be moved into the new building which is expected to be completed by 1994.

Grace Corrigan, mother of 51-L teacher in space **Christa McAuliffe**, will be the keynote speaker at the event. KSC Center Director **Robert L. Crippen**, Chairman of the AMF board of directors **Alan Helman** and AMF President **James DeSantis** are also scheduled to speak. The theme of the event is "youth" and the Merritt Island High School Band will perform for the invited guests which include former Gemini and Apollo astronaut **James Lovell** and relatives of deceased astronauts **Roger Chaffee, Ed White, Elliot See,** Jr. and **Gregory Jarvis**. In addition, the Satellite High School Air Force Junior ROTC will present

the colors. [KSC Release No. 168-92, Dec. 7, 1992; Banke, FLORIDA TODAY, p. 1A, Dec.10, 1992; Banke, FLORIDA TODAY, Dec. 11, 1992.]

December 8: **LANDING DELAY PROBABLE**

Kennedy Space Center officials who have an eye on the weather are planning to extend Discovery's Department of Defense STS 53 mission. Commander **David M. Walker** said December 7, "We haven't run out of food yet, so we're in no hurry. Forecasters predict cloudy skies for Brevard's Wednesday afternoon and the prospects are "definitely bad" at Edwards Air Force Base, CA, and at the Northrup Strip (White Sands, NM). NASA Flight Director **Milt Heflin** said, "Right now we plan to land at KSC on Wednesday." The initial KSC landing opportunity (at 2:16 p.m. EST) will require a deorbit burn at 1:11 p.m. EST. A second landing opportunity occurs at 3:50 p.m. EST. Some NASA officials think the upcoming landing at KSC will present an opportunity to study how the vehicle performs in runway crosswinds. [Banke, FLORIDA TODAY, p. 1A, Dec. 8, 1992; Banke, FLORIDA TODAY, p. 1A, Dec. 9, 1992; Date, THE ORLANDO SENTINEL, Dec. 9, 1992.]

WONG/WILLIAMS AWARDED SNOOPYS

Titusville residents **Sharon Wong** and **Edward Williams** have been awarded Silver Snoopys. Wong, who works in the Payload Management and Operations Directorate, was cited for her efforts to interest women and minorities in engineering and space through the KSC mentor program. Williams, a Senior Quality Engineer, was cited for work in resolution of complex quality issues concerning Shuttle hardware processing. [Scott, STAR-ADVOCATE, Dec. 9, 1992.]

December 9: **DISCOVERY LANDS AT EDWARDS; LEAKS**

Discovery landed this afternoon at Edwards Air Force Base (CA) at 3:43 EST; shortly afterward ground crews detected seepage of nitrogen tetroxide propellant. The leak kept the crew inside the Orbiter for more than two hours. Capcom **Kenneth S. Reightler Jr.**, himself an astronaut, said to the crew from Houston, "One thing is for sure, you will not get to walk around and kick the tires after you egress. Mission Commander **David M. Walker** replied, "It is a big disappointment if we have to wear the helmets and don't get to use the slide." The fumes of toxic gas were dispersed by a large fan and the astronauts left the vehicle in the usual manner - a portable staircase. Discovery's mission was the eighth and last of 1992. Kennedy Space Center Director **Robert L. Crippen** said, "We ended up having about as successful a year as I can have possibly wished for back a year ago when I first showed up at KSC as center director. This mission just kind of topped it off. Of course, we have to get [Discovery] home from Edwards, but we know how to take care of that." The next Shuttle mission is Endeavour's STS 54 flight which is tentatively scheduled to launch from KSC on January 13, 1993. [Banke and Halvorson, FLORIDA TODAY, pp. 1A-2A, Dec. 10, 1992; "Discovery's Return," THE ORLANDO SENTINEL, p. A-1 and on A-4, Dec. 9, 1992.]

December 10: **CRIPPEN TO BRIEF BREVARD LEADERS**

Business executives and elected officials throughout Brevard County will be briefed on current KSC programs and plans, then space center's economic impact on the area, and the status of Space Station Freedom. The briefing is set to begin at 9:00 a.m., December 15, 1992, in the Galaxy Theater at Spaceport USA. Center Director **Robert L. Crippen** will

provide the group with a review of KSC's 1992 activities and an overview of near-term plans and how they relate to Brevard County. Crippen will respond to questions following his remarks. Space Station Project Manager at Kennedy Space Center **John R. Lyon** will brief attendees on the overall progress of the Space Station Freedom program and its impact on the local area. [Notice to Editors/News Directors, KSC Release No. 170-92. Dec. 10, 1992.]

KSC: MCDONNELL DOUGLAS EXTENDED

Kennedy Space Center has awarded McDonnell Douglas Space Systems Co. (Kennedy Space Center Division) a three-year extension of its existing contract for payload ground operations services, valued at approximately $561.4 million. The extension, effective January 1, 1993, through December 31, 1995, brings the cumulative value of the contract to $1.2 billion. This is the second extension of the payload ground operations contract awarded to McDonnell Douglas in January 1987. Under the cost-plus-award-fee extension, McDonnell Douglas will continue to provide ground support, test and integration for payload operations at Kennedy Space Center. [Release: C92-21, Dec. 10, 1992; "McDonnell Douglas Wins NASA Extension," FLORIDA TODAY, Dec. 12, 1992.]

REPLACEMENT OF FAULTY SENSORS

NASA is replacing engine sensors which were produced in the same group as the ones which failed in two of the last three Shuttle missions, according to **Boyce Mix** who is Deputy Manager of the Space Shuttle Main Engine program at Marshall Space Flight Center (Huntsville, AL). "Both of these [sensor failures] were of a particular lot number." When faulty readings are sent to the engine computer, the information is ignored. "We think that the pump is more reliable than the sensor," added Mix. [Date, THE ORLANDO SENTINEL, p. A-4, Dec. 11, 1992.]

December 11:

STS 54: ENDEAVOUR AT LC 39B

Pre-launch hypergolic propellant loads into Endeavour have been completed at LC 39B; the TDRS/Orbiter integration verification test of the STS 54 payload is finished and the pad is open again for normal work activities as of 10 p.m. last night. Work in progress: securing heaters for the Orbital Maneuvering system and reaction control system for powerdown this weekend; preparations for the upcoming terminal countdown demonstration test and for auxiliary power unit leak checks. Scheduled activities: terminal countdown demonstration test next week; crew arrival and PAO session at LC 39B; opening of payload bay doors; launch readiness review; flight readiness review; TDRS/IUS end-to-end test; IUS flight readiness checks. [KSC Space Shuttle Status Report, Dec. 11, 1992.]

DISCOVERY: LEAK DELAYS RETURN TO KSC

Discovery remains in the mate-demate device at the Dryden Flight Research Center following its landing at 3:43 p.m. EST, December 9. The vehicle has been jacked and leveled and operations are continuing to prepare it for ferry flight beginning December 15. Discovery is slated for a two-day cross-country flight atop the modified 747 Shuttle Carrier Aircraft. If weather allows, arrival is targeted for mid-afternoon December 16, 1992. [Banke, FLORIDA TODAY, Dec. 8, 1992; Banke, FLORIDA TODAY, Dec. 11, 1992; Date, THE ORLANDO SENTINEL, P. A-18, Dec. 10, 1992; KSC Space Shuttle Status Report, Dec. 11, 1992.]

COLUMBIA: IN OPF BAY 2

Processing activities for Columbia's STS 55 mission continue unabated in Orbiter Processing Facility Bay 2. Upcoming operations include: orbital maneuvering system functional tests; freon coolant loop servicing and tests; hydraulic system operations; landing gear functional tests; and aerosurface functional checks. Rollover to the VAB is targeted for early February. Work on the Solid Rocket Boosters is also continuing in the Vehicle Assembly Building with the right forward segment being mated today. Next week, work will commence to demate the left forward center segment; the segment has failed two low-pressure leak checks in the past week, though the leaks are believed attributable to faulty ground support equipment. However, managers have decided to destack the left forward center segment to confirm this theory. This unplanned operation is expected to have no impact on the launch of STS 55, however, it will slip the external tank mating into early 1993. [KSC Space Shuttle Status Report, Dec. 11, 1992.]

December 12:

KSC: BUSY WEEK ON TAP

Endeavour's five person crew arrive at Kennedy Space Center December 14 to take part in a terminal countdown demonstration test for STS 54. "It's essentially a dress rehearsal for launch," said KSC spokesman **Bruce Buckingham**. Discovery, meanwhile, is being readied for its ferry flight home to KSC from California; arrival of the Orbiter and the Shuttle Carrier Aircraft is expected to be noon, December 16. The Air Force is launching a Delta rocket at Cape Canaveral on the 16th, as well. [Halvorson, FLORIDA TODAY, p. 3A, Dec. 13, 1992.]

December 14:

STS 54: ENDEAVOUR'S PROCESSING FLOW

Technicians continue processing Endeavour for its January 1993 launch on the STS 54 mission. Work in progress today: Orbiter power is on through December 23; TDRS/IUS payload end-to-end communications test; delivery of liquid oxygen to Launch Complex 39B; Orbiter/external tank quick disconnect purges; preparations for terminal countdown demonstration test (TCDT); astronaut arrival for TCDT; astronaut M113 orientation and driver training; astronaut fit check of launch/re-entry suits. Scheduled activities: start of TCDT December 15; astronaut pad safety training; TCDT T-0 at 11 a.m. December 16; TDRS/IUS launch simulation exercise; KSC launch readiness review (LRR) and main engine flight readiness test December 17; flight readiness review (FRR) December 22. [SPACE SHUTTLE STATUS REPORT, Dec. 14, 1992.]

DISCOVERY PREPARES FOR FERRYING

At NASA's Dryden Flight Research Facility at Edwards Air Force Base (CA), the ferry flight tail cone is being attached to Discovery. The Orbiter will be mated to the 747 Shuttle Carrier Aircraft tonight. Departure from Edwards is set for local sunrise December 15 with the arrival at KSC scheduled for noon December 16. Weather is marginal in east Texas and Louisiana which could extend the ferry flight. [SPACE SHUTTLE STATUS REPORT, Dec. 14, 1992.]

CRF OFFICIAL OPENING

Kennedy Space Center's newest building, the Canister Rotation Facility, will be officially open after a ceremonial ribbon-cutting on Wednesday, December 16 at 1 p.m. KSC Director **Robert L. Crippen**; **John T. Conway**, Director of Payload Management and

Operations; and **George Faenza**, Vice-President/General Manager, McDonnell Douglas Space Systems Company, are among the speakers at the event. Designed to provide space for rotating the canister containing Shuttle payloads, the 7,200 square-foot facility features a 100-ton bridge crane, support stands and access platforms. Located in KSC's Industrial Area, the building is 60 ft. by 120 ft. by 141 ft. Ivey's Construction (Merritt Island, FL) designed and built this facility under contract with NASA for $5,985,000. [Note to Editors/News Directors, KSC Release No. 171-92, Dec. 14, 1992.]

December 15: **STS 54: ENDEAVOUR AT PAD**

At Launch Complex 39B, workers have completed an end-to-end communications test of the TDRS/IUS payload for Endeavour's STS 54 mission next month. A DXS compatibility test has concluded, as well. Liquid oxygen has been delivered to the pad and Orbiter/external tank quick disconnect purges are now finished. Completed astronaut training includes: M113 (pad escape vehicle) orientation and driver training and fit checks of launch/re-entry suits. Work in progress: terminal countdown demonstration test; astronaut Shuttle Training Aircraft (STA) flights; astronaut pad B emergency egress training; astronaut inspection of TDRS/IUS payload in bay; delivery of liquid hydrogen to pad storage spheres; preparation of Orbiter hydraulics for flight readiness test; calibration of inertial measurement units; solid rocket booster flight battery installation and crew cabin and aft compartment cleaning. Scheduled work: completion of TCDT; TDRS/IUS launch simulation exercise; SRB parachute camera installation; beginning of IUS flight readiness checks; KSC launch readiness review (LRR); main engine flight readiness test; installation of IUS flight batteries and flight readiness review (FRR) set for December 22. [SPACE SHUTTLE STATUS REPORT, Dec. 15, 1992.]

DISCOVERY: FERRY FLIGHT PLANS

At Dryden's Flight Research Facility (Edwards Air Force Base, CA), mating Discovery to the 747 Shuttle Carrier Aircraft is under way. Difficulty retracting the Orbiter's landing gear has delayed departure until no earlier than 1 p.m. PST. If departure occurs today, the destination will be Biggs Army Air Field (El Paso, TX) for an overnight stop. Regardless, weather continues to be poor in east Texas and Louisiana which likely will extend the ferry flight. The arrival of Discovery at KSC is expected to occur on approximately Friday. [SPACE SHUTTLE STATUS REPORT, Dec. 15, 1992.]

STS 55: BOOSTER STACKING ACTIVITY

STS 55 solid rocket booster stacking activity: In the Vehicle Assembly Building, the left forward center segment was destacked yesterday and a new set of seals is being installed today. Restacking is being scheduled for December 17. While the mating of the external tank to the solid rocket booster stack has been rescheduled to occur after the Christmas holidays, there continues to be no STS 55 rollout or launch date impact. [SPACE SHUTTLE STATUS REPORT, Dec. 15, 1992.]

December 16: **PRESS TO SEE SPACELAB D-2**

Spacelab D-2, primary payload of STS 55 and the second of two flights dedicated to Germany, will be displayed for the news media on Friday, December 18. KSC Payload Processing Manager **Russ Lunnen** and D-2 Deputy Mission Manager for the German Aerospace Research Establishment (DLR) **Hermann Kurscheid** will respond to questions. On January 7, Spacelab-D is slated to be transferred from the Operations & Checkout

Building High Bay to the Orbiter Processing Facility for installation inside Columbia's cargo bay. STS 55 is scheduled for a February 1993 launch with a seven person crew including two German Payload Specialists. During the nine-day flight, some 90 experiments will be conducted in the areas of astronomy, biology, materials sciences, medicine and space technology. Spacelab D-1 was flown aboard Challenger on STS 61A in 1985. [KSC Release No. 172-92, Dec. 16, 1992.]

STS 54 PAD PREPARATIONS FOR 93 LAUNCH

The terminal countdown demonstration test for STS 54 has been completed as has the TDRS/IUS simulation. The STS 54 crew finished its emergency egress training and inspection of the mission's prime cargo: TDRS/IUS. Liquid hydrogen has been delivered to the LC39B storage spheres and pad crews have conducted an Orbiter/external tank cavity purge leak check and prepared Orbiter hydraulics for the upcoming flight readiness test. The solid rocket booster flight batteries have been installed. Work in progress: flight readiness test of main engines and flight controls; IUS flight readiness checks; calibration of inertial measurement units; crew cabin and aft compartment cleaning; SRB parachute camera installation; avionics bay closeouts and calibration of inertial measurement units. Scheduled work includes: TACAN testing; KSC launch readiness review [December 17]; aft main engine compartment confidence test; installation of IUS flight batteries and the December 22 flight readiness review. [SPACE SHUTTLE STATUS REPORT, Dec. 16, 1992; Halvorson, FLORIDA TODAY, p. 2A, Dec. 16, 1992; Halvorson, FLORIDA TODAY, p. 5A, Dec. 17, 1992.]

FERRY FLIGHT CONTINUES

Discovery atop the 747 Shuttle Carrier Aircraft landed at Kelly Air Force Base (San Antonio, TX) last night at 8:14 p.m. EST. Departure is planned for tomorrow with a likely overnight stop in Mississippi and arrival at KSC on December 18. Weather conditions are unacceptable in East Texas and Louisiana for continuing the ferry flight today. [SPACE SHUTTLE STATUS REPORT, Dec. 16, 1992; Halvorson, FLORIDA TODAY, p. 5A, Dec. 16, 1992.]

December 17: **DELTA LAUNCH PROBABLE TONIGHT**

The weather forecast for tonight would allow for an 80% favorable chance for launching the Air Force's Delta II carrying a NAVSTAR satellite. Technical difficulties scrubbed last night's attempt at one minute before liftoff. The launch window for tonight's attempt is between 5:08 and 5:36 p.m. [Halvorson, FLORIDA TODAY, p. 5A, Dec. 17, 1992; Halvorson, FLORIDA TODAY, p. 5A, Dec. 18, 1992.]

STS 54: FLIGHT READINESS TEST DONE

At Launch Complex 39B, technicians processing Endeavour for its STS 54 mission next month have completed the flight readiness test of the Orbiter's main engines and flight controls. The SRB parachute camera has been installed and the TCDT and the TDRS/IUS countdown simulations have been completed as well. Work in progress: IUS flight readiness checks; calibration of inertial measurement units; crew cabin and aft compartment cleaning; avionics bay closeout; TACAN testing and KSC launch readiness review. Scheduled tasks: aft main engine compartment confidence test; aft main engine compartment closeouts; installation of IUS flight batteries and the flight readiness review on December 22. [SPACE SHUTTLE STATUS REPORT, Dec. 17, 1992.]

DISCOVERY FERRY FLIGHT: THE SAGA CONTINUES

Discovery is scheduled to depart Kelly Air Force Base (San Antonio, TX) atop its Shuttle Carrier Aircraft and head for Mississippi's Columbus Air Force Base. There will be an overnight stop due to poor weather conditions in the Florida panhandle. The ferry flight is expected to complete its journey at Kennedy Space Center tomorrow. [SPACE SHUTTLE STATUS REPORT, Dec. 17, 1992.]

SRB ACTIVITY

In the Vehicle Assembly Building, the left booster being processed for the STS 55 mission has passed its initial leak checks, with the second set of tests underway today. Troubleshooting continues on the right booster and a decision is expected later today on whether it will be necessary to destack the right forward segment. Officials have not yet deduced the reason for the leaks in the boosters. [SPACE SHUTTLE STATUS REPORT, Dec. 17, 1992.]

December 18:

STS 54: DXS INTERIM SERVICING

At Launch Complex 39B, technicians have concluded their interim servicing of Endeavour's DXS (Diffuse X-Ray Spectrometer) payload for the STS 54 mission. Calibrations of the Inertial Measurement Unit have been concluded. The flight readiness test is complete as is the KSC launch readiness review. Work in progress: IUS flight readiness checks; IUS range safety hold fire check; IUS flight battery installation; aft main engine compartment confidence test and cleaning; crew cabin and aft compartment cleaning; avionics bay closeouts and testing of Orbiter television cameras. Scheduled work: Orbiter/external tank cavity purge reverification; ordnance installation; flight readiness review; preparations for holiday work suspension and facility outages; closing of payload bay doors for the holidays. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 18, 1992.]

STS 55: COLUMBIA'S PROCESSING FLOW

In OPF Bay 2, technicians working on Columbia for its upcoming STS 55 mission have completed freon coolant loop rework and Orbiter structural inspections. In process currently: forward reaction control system electrical connections; freon closed-loop coolant system checkout; main engine mechanical and electrical connections; main landing gear hydraulic system troubleshooting and tile repair. Scheduled tasks: installation of Spacelab-D2 tunnel adapter next week and configuration of the payload bay for Spacelab and its Spacelab tunnel. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 18, 1992.]

FERRY FLIGHT & STACKING REPORTS

Discovery is enroute to Eglin Air Force Base in the Florida panhandle to refuel the Shuttle Carrier Aircraft. If the weather is acceptable to continue the ferrying, the Orbiter should arrive at Kennedy Space Center at about 2:30 p.m. Tests appear to show that the problem with the right solid rocket booster (STS 55) is likely associated with ground support equipment. [Halvorson, FLORIDA TODAY, p. 5A, Dec. 18, 1992; SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 18, 1992.]

DELTA LAUNCHES SUCCESSFULLY

A Delta 2 rocket, whose launch was delayed twice before, lifted off Launch Complex 17B at 5:16 p.m.; the Cape Canaveral Air Force Station launch had been delayed 12 minutes because of "a minor glitch with range safety equipment." Press spokesman for the Air Force's 45th Space Wing Major **Garian Perugini** said, "It was a real great way to cap 1992." The mission was the 17th in a series of 24 planned launches of Navstar, a global positioning satellite. [Halvorson, FLORIDA TODAY, pp. 1A-2A, Dec. 19, 1992.]

TEST EQUIPMENT BLAMED FOR LEAK

Test equipment has been blamed for a leak of a booster O-ring seal; the seal will not be replaced, according to NASA's **George Diller**. A final leak check for the Columbia booster will be made early tomorrow. Columbia's STS 55 mission is set for February 1993. [Halvorson, FLORIDA TODAY, p. 2A, Dec. 19, 1992.]

December 21:

STS 54: PROCESSING ACTIVITIES

At Launch Complex 39B, technicians preparing Endeavour for its third Shuttle mission have completed: IUS flight readiness checks; retesting of the IUS range safety hold-fire circuit; calibration of inertial measurement units; crew cabin and aft compartment cleaning; avionics bay closeouts; aft main engine compartment confidence test. Work in progress: IUS ordnance installation; IUS flight battery installation; Space Shuttle vehicle ordnance installation; aft compartment closeouts; preparations for holiday work suspension. Work scheduled: flight readiness review; closing of payload bay doors for the holidays; powering down the Space Shuttle vehicle for the holidays. [SPACE SHUTTLE STATUS REPORT, Dec. 21, 1992.]

DISCOVERY MAKES RETURN TO KSC

Discovery, atop the 747 Shuttle Carrier Aircraft, arrived at KSC at 2:41 p.m. EST on Friday [Dec. 18, 1992]. It was demated from the 747 and arrived at OPF Bay 3 at 7:25 a.m. December 19. The Orbiter has been jacked and leveled. The forward reaction control system (FRCS) has been removed and is to be transported to the Hypergol Maintenance Facility (HMF) today. Also in work today is the removal of the ferry flight tail cone. The payload bay doors are being opened for the removal of the airborne support equipment which will be followed by troubleshooting of ODERACS. [Halvorson, FLORIDA TODAY, pp. 1A-2A, Dec. 19, 1992; SPACE SHUTTLE STATUS REPORT, Dec. 21, 1992.]

SRB STACKING

In the Vehicle Assembly Building, STS 55 solid rocket booster stacking and leak checks of the left and right boosters was successfully completed December 19. Joint closeouts are in work. Mating the external tank is scheduled to occur when work resumes after the Christmas holidays. [SPACE SHUTTLE STATUS REPORT, Dec. 21, 1992.]

December 22:

STS 54 LAUNCH: JANUARY 13

NASA managers today set January 13th as the official launch date for the first Shuttle mission of 1993. The flight, designated STS 54, has two primary objectives: the deployment of the Tracking and Data Relay Satellite (TDRS-F) and gathering astronomical observations of invisible X-ray Spectrometer (DXS) PAYLOAD. A space walk (EVA) to

evaluate training methods and gain additional EVA experience will also occur during the mission. The launch window for January 13th opens at 8:25 a.m. EST and extends for 2 1/2 hours. The mission duration is planned for 6 days. Landing is scheduled for January 19th at Kennedy Space Center, FL. Commanding the STS 54 mission will be **John H. Casper** who will be making his 2nd flight. **Donald R. McMonagle**, making his 2nd flight will serve as Pilot. The three Mission Specialists for Endeavour's third mission are: **Mario Runco Jr.**, making his 2nd flight; **Gregory J. Harbaugh**, making his 2nd flight and **Susan J. Helms**, making her first flight. [Banke, FLORIDA TODAY, p. 1A, Dec. 23, 1992; NOTE TO EDITORS, Dec. 22, 1992.]

STS 54: IUS ORDNANCE INSTALLED

Technicians at Launch Complex 39B have installed both the IUS ordnance and that of the Space Shuttle Endeavour. They have also installed the IUS flight battery. The IUS flight readiness checks and aft main engine compartment confidence tests have also been completed. Work in progress today: flight readiness review (FRR); aft main engine compartment closeouts; closing of payload bay doors for the holidays at 2 p.m.; power off the Orbiter for the holidays and preparations for holiday work suspension and holiday outages. Technicians will continue aft main engine compartment closeouts and securing LC 39B for the holidays. [SPACE SHUTTLE STATUS REPORT, Dec. 22, 1992.]

MCAULIFFE BRIDGE: LOOSE BOLTS TIE UP TRAFFIC

A DOT inspector discovered loose bolts on the north span of the Christa McAuliffe Bridge today and the repairs which followed closed the southbound lane of traffic from the Kennedy Space Center. North and south-bound lanes were alternated during the delay; "they weren't too happy," said bridgetender **Joyce Winters**. "People probably think, 'What a stupid time to work on this bridge,' but we had no choice in the matter - we didn't want to take any chances." [Martinez, FLORIDA TODAY, p. 2B, Dec. 23, 1992.]

December 23: **STS 54: VEHICLE HOLIDAY CLOSINGS**

After yesterday's flight readiness review, technicians at Launch Complex 39B have closed Endeavour's payload bay doors and sealed the crew cabin for the holidays. They conducted a crew cabin leak check and turned the Orbiter's power off. Today, workers are completing aft main engine compartment closeouts and making preparations for holiday work suspensions and holiday outages. Work scheduled: Pad B securing and walkdown for the holidays and Launch Complex 39 facility and annual preventative maintenance. [SPACE SHUTTLE STATUS REPORT, Dec. 23, 1992.]

NASA: BUSINESS CONTRACTING GOALS

NASA Administrator **Daniel S. Goldin** today announced that the agency has exceeded its 1992 goal of awarding 6.7 percent of the total value of the agency's prime and subcontracts to small disadvantaged businesses. Over $865 million was awarded to minority organizations, representing 7.2 percent of the total $12 billion awarded during the last fiscal year. In 1990, NASA developed a plan to meet a goal of awarding 8 percent of the total to small disadvantaged businesses (SDBs) by the end of fiscal year 1994. "This represents a major step forward to meeting and, hopefully, exceeding our 1994 goal in 1993," said Goldin. "We are continuing the momentum by recently setting aside appropriate procurements for SDBs, including woman-owned firms, and we are developing an awards program for technical small businesses. I have directed top NASA officials to take steps to substantively increase SDB subcontracting in our top 100

contracts. Also, I have made reaching our 8 percent goal a part of the performance evaluations of NASA's associate and assistant administrators and center directors." [NASA Release: 92-231, Dec. 23, 1992.]

MINORITY BUSINESS COMMITTEE ESTABLISHED

NASA Administrator **Daniel S. Goldin** today announced the names of the Chairman and 23 members selected to serve on the newly-formed NASA Minority Business Resource Advisory Committee. The committee, comprised of members of the business community, will help NASA identify more small, disadvantaged and women-owned firms which potentially could do business with the space agency. NASA has a goal of awarding 8 percent of its contracts to small disadvantaged businesses (SDBs) by the end of fiscal year 1994. "This committee will help to disprove the notion that there are no high-tech small and disadvantaged businesses. We know they're out there, and we'll find them and nurture them because we want to work with firms that have the desire to reach for the American dream," Goldin said in his announcement remarks. [NASA Release: 92-230, Dec. 23, 1992.]

December 24:

ENDEAVOUR PROCESSING SUMMARY

Endeavour is at Launch Complex 39B being prepared for its January 13, STS 54 mission. Work completed prior to the holidays: closure and securing of the crew cabin access hatch; closing the payload bay doors; installation of the aft compartment flight doors and powering off the Orbiter. Work scheduled: resumption of the aft main engine compartment closeouts; loading of mass memory units; installation of EVA spacesuits; installation of flight crew equipment in the crew module; ordnance connections and stray voltage checks; hypergolic tank pressurization; external tank purges; IUS countdown test/guidance system calibration and alignment; TDRS battery charging and DXS interim servicing. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 24, 1992.]

DISCOVERY: TAIL CONE REMOVED

Discovery, which is now in OPF Bay 3, has been safed and the hypergolic residual deservicing is complete; the ferry flight tail cone has also been removed. In the OPF, technicians have: removed the forward reaction control system; opened the Orbiter's payload bay doors; removed the USAF airborne support system; Orbiter/ODERACS interface troubleshooting is finished and ODERACS has been removed. Orbiter turnaround activities have been scheduled as has the reconfiguration of the payload bay to receive the ATLAS-2 spacecraft. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 24, 1992.]

COLUMBIA: GAS BEAMS INSTALLED

Columbia is undergoing processing for its STS 55 mission which is highlighted by the activities of Spacelab-D2. Work completed: forward reaction control system installation/connects/checkout; OMS pod leak and functional checks; hydraulic system servicing/leak and functional checks; drag chute installation; GAS (Get Away Specialist) beams installed; Spacelab tunnel adapter installation; main landing gear functional test; freon closed-loop coolant system leak checks; main engine mechanical and electrical connections; freon coolant loop rework. Work scheduled: resumption of standard repair work, payload bay cleaning and freon coolant loop functional tests; installation of

Spacelab tunnel and the Spacelab-D2 laboratory module. [SPACE SHUTTLE WEEKLY STATUS SUMMARY, Dec. 24, 1992.]

December 26: **SR 3 WIDENING TO RE-START**

"We feel we have 12 months of work left," said **Henry Minneboo**, Brevard County's Road and Bridge Division Director. Minneboo referred to the as yet unfinished widening of State Road 3. Kennedy Space Center finished its portion of the widening project on the north end of the road over a year ago. In October of 1991, Brevard County stopped working because the county had failed to obtain the required rights of way to complete the work. Not only will SR 3 be completed by January 1994, according to Minneboo, but other improvements will be made: opening the Barge Canal bridge earlier to permit canal traffic to pass before rush hour; synchronizing traffic lights on SR 3, SR 528 and the Sea Ray boat plant; reducing the number of school bus routes north of the bridge and staggering work schedules of some Sea Ray employees to lessen congestion. The project was originally estimated to cost $9.4 million; it has already passed the $12.5 million mark due to the delays and disruptions which have already occurred. A north-bound bridge will begin construction in July 1994. Prior to that, McAuliffe Bridge will be altered to accommodate two lanes of south-bound traffic. [Reitz, FLORIDA TODAY, p. 1B, Dec. 27, 1992.]

December 28: **BASE OPERATIONS CONTRACT EXTENDED**

NASA has extended the current Kennedy Space Center Base Operations Contract held by EG&G Florida, Inc., through February 28, 1993. The contract extension also includes four additional 1-month options. The approximate amount of the basic 2-month period is $32.9 million dollars; the four 1-month options are collectively valued at $64.4 million. This contract extension is for interim support services during the period of time required to resolve protests of the contract's follow-on competitive award to Lockheed Space Operations Co. [NASA Release: C92-23, Dec. 28, 1992; Banke, (FLORIDA TODAY, p. 10C, Dec. 29, 1992; Date, THE ORLANDO SENTINEL, Dec. 5, 1992.]

December 31: **SNOOPYS AWARDED**

Astronaut **Ellen S. Baker** has presented Silver Snoopy Awards to Rockwell International employees **Keith Pope** and **William Lester**. Both recipients are residents of Titusville, FL. ["Silver Snoopys Awarded," FLORIDA TODAY, p. 9E, Jan. 3, 1993.]

INDEX

INSERT Orbiter Naming Program .. 81

Space Congressional Medal of Honor . . . 201

27

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